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NEW SPECIES OF *DENDROSOTER* FROM INDIA AND AFRICA  
(HYM., BRACONIDAE)

By G. E. J. NIXON, B.A., F.R.E.S.

(Imperial Institute of Entomology.)

THE original purpose of this paper was to describe three species of *Dendrosoter* from India, received for identification from the Forest Research Institute, Dehra Dun. One of them was subsequently found to be identical with a palearctic species.

While examining further material in the British Museum, I found a few species taken by Mr. R. E. Turner in Cape Province. I consider these of such interest because of the light they throw on the structural range of the genus within the broad definition given below, that I include descriptions of them in the following pages.

Apart from the ten palearctic species ascribed to *Dendrosoter* (Fahringer, 1930), only three other Old World members of the genus have apparently been described; these are African insects. I have seen the type of one of them, *D. camerunus* Enderlein, thanks to the kindness of the authorities of the Deutsches Entomologisches Institut, to whom I here express my grateful acknowledgement. I have been unable to recognise the other two species from their descriptions. A reference to them is given at the end of the paper.

Also, I include in the key the only three species of the genus that exist in the British Museum.

The types of the new species are in the British Museum.

DORYCTINAE.

*Dendrosoter* Wesmael.

The genus, in the admittedly wide sense in which I have interpreted it, is characterised essentially by the presence of a raised callous-like swelling on each side of the frons against the inner eye-margin. This is a conspicuous feature and the only character of generic value which the species in this paper have in common.

It is probably true that *Dendrosoter*, through my wide interpretation of it, now possesses an unnatural flexibility. Certainly such species as *D. elegans* sp. n. and *D. olynthus* sp. n. show differences which appear to lie outside the range of generic variation. I do not think, however, that any useful purpose would

be served, at this stage, by creating new genera in an arbitrary manner. Any step of that kind would best be preceded by a much more exhaustive study of the DORYCTINÆ and related subfamilies than I can so far claim to have made.

In this paper, the apparent second tergite of the abdomen, which is made up of two fused segments, will be referred to as "tergite (2, 3)" and treated as though it were one segment. If "tergite 2" is referred to, this is then to be taken as the morphologically true second segment, which in the particular case is in some way sharply delimited.

### Key to the species.

(♀♀.)

1. Abdomen subpetiolate; petiole from  $2\frac{1}{2}$  to 3 times as long as its apical width . . . . . 2.  
 Abdomen not subpetiolate; petiole at most  $1\frac{1}{2}$  times as long as its apical width . . . . . 3.
2. Tergite (2, 3) with only a trace of striation at base; stigma pale only basally . . . . . *elegans* sp. n., S. Africa.  
 Tergite (2, 3) longitudinally sculptured all over basal half (hence tergite 2 sharply delimited); stigma pale yellow throughout . . . . . *pallidistigma* sp. n., S. Africa.
3. Nervus parallelus emitted from the 2nd discoidal cell at about middle and not in the least forming a straight line with the median vein; recurrent nervure exactly interstitial . . . . . 4.  
 Nervus parallelus emitted from above the middle of the 2nd discoidal cell and in any case, if not exactly interstitial with the median vein, then forming with it a virtually straight line; recurrent nervure always received clearly into the 2nd cubital cell . . . . . 5.
4. Petiole finely longitudinally striate-reticulate . . . . . *camerunus* Enderlein, Cameroon.  
 Petiole evenly reticulate, reticulations without a longitudinal tendency . . . . . *olythus* sp. n., S. Africa.
5. 2nd abscissa of the radius at least about twice as long as the 1st intercubitus and forming with the very short 1st abscissa an angle of  $90^\circ$  or less. (Spp. with tergite (2, 3) entirely smooth; ocelli arranged in a triangle whose base is much shorter than its sides) . . . . . 6.  
 2nd abscissa of the radius at most  $1\frac{1}{2}$  times as long as the 1st intercubitus and then tergite (2, 3) is sculptured at least basally; angle between 1st and 2nd abscissa of radius always more than  $90^\circ$  . . . . . 7.
6. 2nd abscissa of the radius towards its apex strongly curved upwards so that the 2nd cubital cell is markedly widened apically; mesonotum in profile sloping very gradually to pronotum. (Sp. with the fore-wings strongly embrowned and having a complete middle transverse hyaline fascia and a shorter one along the 2nd intercubitus; appearing further very shining owing to their surface being unusually sparsely hairy) . . . . . *labdacus* sp. n., India.  
 2nd abscissa of the radius towards apex not curved upwards, so that the 2nd cubital cell is more or less parallel-sided; mesonotum in profile sloping almost perpendicularly to pronotum. (Sp. with the fore-wings usually more or less hyaline, at most with a vague greyish clouding; much less shining than in *labdacus*, their surface much more hairy) . . . . . *hartigii* Ratz., Pal. region.
7. Tergite (2, 3) sculptured over less than basal half, not sharply margined laterally from base to apex; mesopleura smooth and shining in part . . . . . 8.  
 Tergite (2, 3) sculptured over more than its basal half, sharply margined laterally from base to apex; mesopleura dull, sculptured all over. (Spp. with the ocelli arranged almost in an equilateral triangle) . . . . . 10.

8. Ocelli arranged in a triangle whose base is clearly longer than its sides. (Sp. with the pronotum very short, in profile projecting only very slightly or not at all beyond the mesonotum; petiole tending to be striate-reticulate, though in small individuals the striate element predominates) *thelepte* sp. n., India.
- Ocelli arranged in a triangle whose base is clearly a little shorter than its sides . . . . . 9.
9. Mesonotum thickly covered with fine adpressed pubescence; recurrent nervure received into the 2nd cubital cell at a distance from transverse cubitus several times less than its own length. (Sp. with the mesonotum somewhat gibbose in front, falling away perpendicularly to the pronotum) *protuberans* Nees, Europe.
- Mesonotum at most with minute scattered hairs, appearing glabrous; recurrent nervure received into the 2nd cubital cell at a distance equal to at least half its own length . . . . . *middendorffi* Ratz., Europe, India.
10. Tergite (2, 3) striate-punctate, the striate element strong; 2nd abscissa of the radius not much longer than the 1st intercubitus; predominantly pale brownish-yellow sp. . . . . *spilus* sp. n., S. Africa.
- Tergite (2, 3) very closely punctate-reticulate, appearing shagreened; 2nd abscissa of the radius much longer than the 1st intercubitus; predominantly dark brown sp. . . . . *orithylus* sp. n., S. Africa.

(33.)

1. 3rd segment of the maxillary palpi enormously dilated, oval. (Sp. with the radius and cubitus much widened; recurrent nervure almost interstitial; stigma of hind-wings small, about  $2\frac{1}{2}$  times as long as wide) *protuberans* (Nees).
- 3rd segment of the maxillary palpi of ordinary form . . . . . 2.
2. Radius, together with the two distal abscissae of the cubitus strongly dilated . . . . . 3.
- Radius, together with the two distal abscissae of the cubitus of ordinary form . . . . . 4.
3. Mesonotum in front sloping very gradually to pronotum, almost flat here; fore-wings very shining owing to their being unusually sparsely hairy. (Sp. with the fore-wings strongly embrowned and marked with hyaline fasciae) . . . . . *labdacus* sp. n.
- Mesonotum in front sloping more or less perpendicularly to pronotum; fore-wings not shining, being pubescent to the normal extent. (Sp. with the fore-wings nearly hyaline in small examples, but much darkened in larger ones, in which hyaline fasciae similar to those of *labdacus* appear, though less sharply defined (figs. 7, 8)) . . . . . *hartigii* (Ratz.).
4. Ocelli arranged in a triangle whose base is very slightly longer than its sides; mesonotum clothed with fine, very short pubescence *thelepte* sp. n.
- Ocelli arranged in a triangle whose base is slightly shorter than its sides; mesonotum almost glabrous . . . . . *middendorffi* (Ratz.).

### *Dendrosoter olynthus* sp. n.

♀. Dark brown with reddish suffusions which are most noticeable on the frontal callouses, propodeum above, and the petiole. All the tibiae narrowly whitish at base. Head clothed everywhere with whitish hairs which are longer, finer and more conspicuous on face and cheeks (fig. 17). Face and malar space evenly reticulated, the meshes about the size of an ocellus. Clypeus ill-defined, feebly semicircular. Vertex reticulate-rugose with a transverse tendency. Temples, and head behind the eyes, reticulate-rugose. Cheeks behind becoming smoother, the surface shining, with moderate-sized punctures. Ocelli arranged in a virtually equilateral triangle. Antennae with 31-32 segments; funicle 1 equal in

length to 2. Frontal callouses without well-defined cristulae showing as darkened lines. Maxillary palpi as long as the front tarsus. Eyes large, the shortest distance between them and the occipital margin being less than half the greatest length of the eye. *Thorax*: Mesonotum somewhat truncate in front (fig. 15), its middle lobe being gibbose and falling away perpendicularly to pronotum; densely clothed with short, silvery-golden hairs which are adpressed over the greater part of the lobes but less so and longer elsewhere. Notauli deeply impressed, strongly crenate and converging on a coarsely reticulate sunken area. Lobes of the mesonotum finely rugose, the sculpture stronger than in *D. orithylus* and *D. sipius*. Mesopleura coarsely reticulate except for an oblique shining area which has a certain amount of sculpture. Propodeum transverse, somewhat characteristically reticulate and with long pale hairs at the sides and behind; at base it shows a feeble carina. Fore-wings very pale fuscous, without hyaline fasciae (figs. 4, 5); lower basal cell of hind-wings much longer than in the other species dealt with in this paper, except *D. camerunus* End., the 1st abscissa of the median vein being almost as long as the 2nd. Legs: hind femora thickly clothed with fine silky, mostly adpressed hairs; hind tibiae without outstanding hairs and with a row of 5 or 6 inconspicuous, short, adpressed spines spaced along its whole length; segment 2 of the hind tarsus slightly less than half 1; hind coxae on their outer surface strongly rugose. *Abdomen*: petiole appearing markedly longer than wide, though the difference on measurement only about 5:4, its surface evenly reticulate all over. Tergite (2, 3) sharply margined laterally from base to apex; a fine shining line shows the suture between the two tergites; basally to this line, the surface is striate-reticulate, though the striate element is weak; the sculpture becomes progressively finer apically and beyond the suture it passes from punctate-reticulate to merely finely and very closely punctate. Following tergites with a conspicuous row of ciliae. Epipleura with much pale pubescence. Ovipositor a little shorter than the body.

CAPE PROVINCE: Pondoland, Port St. John (*R. E. Turner*), 1924, May 1 ♀, Type, Jan. 1 ♀, Feb. 1 ♀. The female taken in February has the frontal callouses, propodeum and petiole entirely black; the petiole is markedly transversely reticulate.

This and the next species are amply distinct—as emphasised in the key—from all the other species described or dealt with in this paper, chiefly because of venation and pubescence. *D. olynthus* is probably characterised by its sculpture, especially of abdomen; certainly it is the sculpture of the abdomen that separates it most easily from the following species.

### *Dendrosoter camerunus* Enderlein.

*Dendrosoter camerunus* End., 1912, *Arch. Naturgesch.* 78 (A) (2): 36.

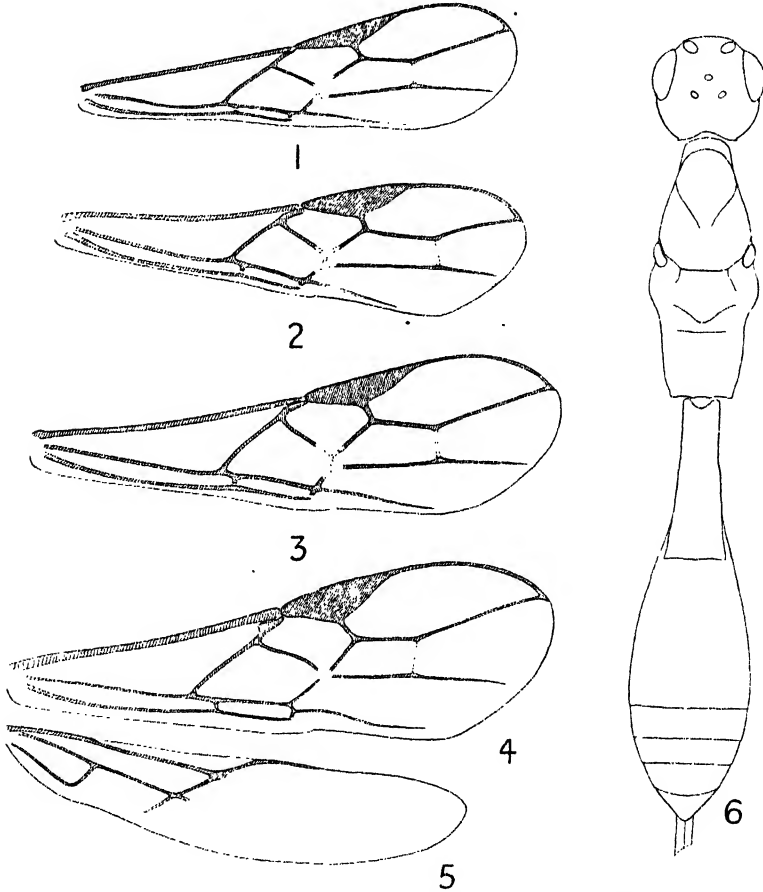
This species is closely and very naturally related to *D. olynthus* and may be, I think, only a geographical race of it. It differs from *D. olynthus* as follows:—

Face and frons pale brown. Clypeus more sharply defined, clearly triangular. Vertex falling away to the occipital margin more steeply; this declivous part of the vertex is more or less flat and is finely transversely striated, the striae somewhat broken.

Lobes of the mesonotum showing a slightly stronger sculpture than in *D. olynthus*. Mesopleura coarsely reticulate all over, showing no trace of a smooth space as in *D. olynthus*. Lower limiting margin of the sternaui less clearly defined than in *D. olynthus* and the mesosternum a little less shining owing to the presence of a stronger surface sculpture. Lower basal cell of the hind-wing shorter than in *D. olynthus*, the 1st abscissa of the median vein being about  $\frac{1}{2}$  the length of the 2nd. Hind tibiae without short adpressed spines such as occur in *D. olynthus*. Hairs of the hind femora less noticeable.

Petiole slightly more narrowed to base, evenly and finely striate-reticulate; the striate element is well marked. Tergite (2, 3) from the base to the very feebly indicated suture with a sculpture essentially like that of the petiole but much finer; on its apical half tergite (2, 3) appears finely and evenly beaded. Ciliae of the apical tergites shorter and much less conspicuous than in *D. olynthus* (this may be more apparent than real, as the type is not in very good condition).

CAMEROON : (*Conradi*) described by Enderlein from one ♀, the type.



FIGS. 1-6.—1. *Dendrosoter elegans* sp. n., fore-wing of ♀; 2. *D. orithylus* sp. n., fore-wing of ♀; 3. *D. sipius* sp. n., fore-wing of ♀; 4. *D. olynthus* sp. n., fore-wing of ♀; 5. *D. olynthus* sp. n., hind-wing of ♀; 6. *D. elegans* sp. n., body of ♀.

*Dendrosoter middendorffii* (Ratzeburg).

*Bracon middendorffii* Ratz., 1848, *Ichn. Forstins.* 2 : 32.

♂♀. Body on the whole dark brown. Frontal callouses contrasting reddish-brown. Legs paler than body; tibiae (to a less extent the anterior pair) narrowly whitish at base; in small examples this colour differentiation is not obvious.

♀. Head not widened behind the eyes. Vertex behind the ocelli with transverse striation which towards temples breaks up into vague scaly-reticulation. Temples and



head behind the eyes usually virtually smooth; in largest examples there is some very weak scaly-reticulation. Frontal callouses with a number of transverse, more or less broken cristulae. Ocelli arranged in a triangle whose base is clearly a little shorter than its sides. Antennae with about 20–24 segments; funicle 1 about  $\frac{1}{2}$  as long as 2. Maxillary palpi somewhat short, hardly twice as long as greatest length of eye. *Thorax* in profile essentially like that of *D. labdacus* (cf. fig. 22) but the mesonotum markedly declivous in front. Mesonotum appearing characteristically glabrous, its minute hairs extremely sparse; evenly scaly-reticulate, especially on anterior lobe, reticulations without a transverse tendency. Notauli usually fairly sharply defined, though their definition at all appears to depend chiefly on the fact that the lobes of the mesonotum are swollen. Mesopleura except within the upper anterior impression smooth and shining; sternauly feebly crenate. Propodeum with its two dorsal areas sculptured, usually evenly scaly-reticulate, but in largest examples with raised rugulosity; areola sometimes distinct, sometimes indistinct but in any case open below. Fore-wings (see fig. of ♂). Legs: hind tibiae with extremely short, semi-erect hairs on its outer side; segment 2 of the hind tarsus almost exactly half 1; front tarsus nearly  $1\frac{1}{2}$  times as long as its tibia. *Abdomen*: petiole about  $1\frac{1}{2}$  times as long as its apical width, evenly and closely striated; sometimes there is present a central smooth line, one or two of the striations being obliterated. Tergite (2, 3) striated on basal third, the medial striations tending to be concentric about the mid-basal point; frequently these medial striations fade out, leaving two more or less semicircular patches of striation on each side of the segment.

♂. Stigma of hind-wings nearly 6 times as long as wide (fig. 12). Tergites (2, 3) to 7 feebly excised.

Length: ♂♀, 2.4–5 mm. (without ovipositor of ♀); most of the males examined (Konian) are about 2 mm.

UNITED PROVINCES: Chakrata, Konian (*C. F. C. Beeson*), 7 ♂♂, 3 ♀♀, bred July 1924 ex *Picea Morinda* Link; Chakrata, Bodyar (*C. F. C. Beeson*), 6 ♀♀, 2 ♂♂, bred July 1924 ex *Cedrus Deodara* Loud.; EUROPE.

This species, which I have interpreted as *D. middendorffii*, being unable to find any difference between the Indian material and material from Europe, is closely related to the *D. hartigii*-group. Besides similarity in facies and venation, although the male shows no sexual dimorphism in the appearance of the veins of the fore-wing, *D. middendorffii* has in common with *D. hartigii* and *D. labdacus* the 1st segment of the funicle shorter than the 2nd, a feature peculiar to these three species.

Owing to great variability in size, it is difficult to say what is characteristic about *D. middendorffii*. Almost bare mesonotum, shape of ocellar triangle and sculpture of 2nd tergite probably sum up its main features.

### *Dendrosoter labdacus* sp. n.

♂♀. Body light honey-brown, the abdomen sometimes slightly darker on apical half. First 5 or 6 segments of antennae paler than those following which are darkened. Middle and hind tibiae (to a less extent the front ones) narrowly whitish at base; hind tibiae sometimes darkened in ♂; hind tarsi whitish in both sexes. Fore-wings with a strong yellowish-fusca clouding, and with 2 sharply defined hyaline fasciae, one cutting off about basal third of stigma, the other restricted to the length of the 2nd intercubitus.

♀. Head distinctly widened behind the eyes (fig. 18). Frontal callouses with a number of transverse broken cristulae. Vertex more or less finely aciculated, though the sculpture tends to be indefinite. Temples and head behind the eyes entirely smooth and shining. Antennae with 19–20 segments; segment 1 of funicle about half the length of 2; first 3 segments very slender, smooth more or less glabrous, markedly narrower than the apical

segments. Maxillary palpi short, only a little longer than the greatest length of the eye. Ocelli arranged in a triangle whose base is much shorter than its sides. *Thorax*: Mesonotum with only sparse, minute adpressed hairs, appearing almost glabrous, very gradually declivous in front, almost flat here (fig. 22); sculpture of mesonotum consisting of broken scaly-reticulation with a slight transverse tendency. Lobes of mesonotum not raised, that is, the notauli, though sharply impressed, superficial. Mesopleura smooth and shining almost everywhere; sternauli showing as a smooth furrow. Legs short; front tarsus not much longer than its tibia, about 4:3; all the femora and tibiae very smooth, without outstanding hairs; segment 2 of the hind tarsus almost exactly half 1. Wings: (fig. 11); recurrent nervure received into 2nd cubital cell at a distance from intercubitus equal to about its own length. Propodeum with some vague rugulosity but without a clearly defined areola. *Abdomen*: petiole only very slightly longer than its apical width, closely and, on the whole, evenly striated; tergite (2, 3) completely smooth. Ovipositor very slightly shorter than the abdomen.

♂. Antennae with 19-22 segments. Wings (figs. 9, 10). Abdomen long, narrow, spindle-shaped; tergites (2, 3) to 7 deeply excised.

Length: ♂♀, 1.8-3.2 mm. (excluding ovipositor of ♀).

UNITED PROVINCES: Dehra Dun, F.R.I. Compound *Type loc.* (C. F. C. Beeson). 46 ♀♀ (Type ♀, 24.x.1924), 9 ♂♂, bred ex *Pinus longifolia* Roxb.; Dehra Dun, Asarori (R. R. Singh), 5 ♀♀, 1 ♂, bred ex *Pinus longifolia* Roxb.

This species and the closely related *D. hartigii* form a natural species-group, characterised chiefly by the venation, *i.e.* the long 2nd abscissa of radius and the angle between the 1st and 2nd abscissae of radius; the short 1st funicular segment is also peculiar to the two species, though it should be noticed that the same segment in the species I call *D. middendorffii* (Ratz.) is also short.

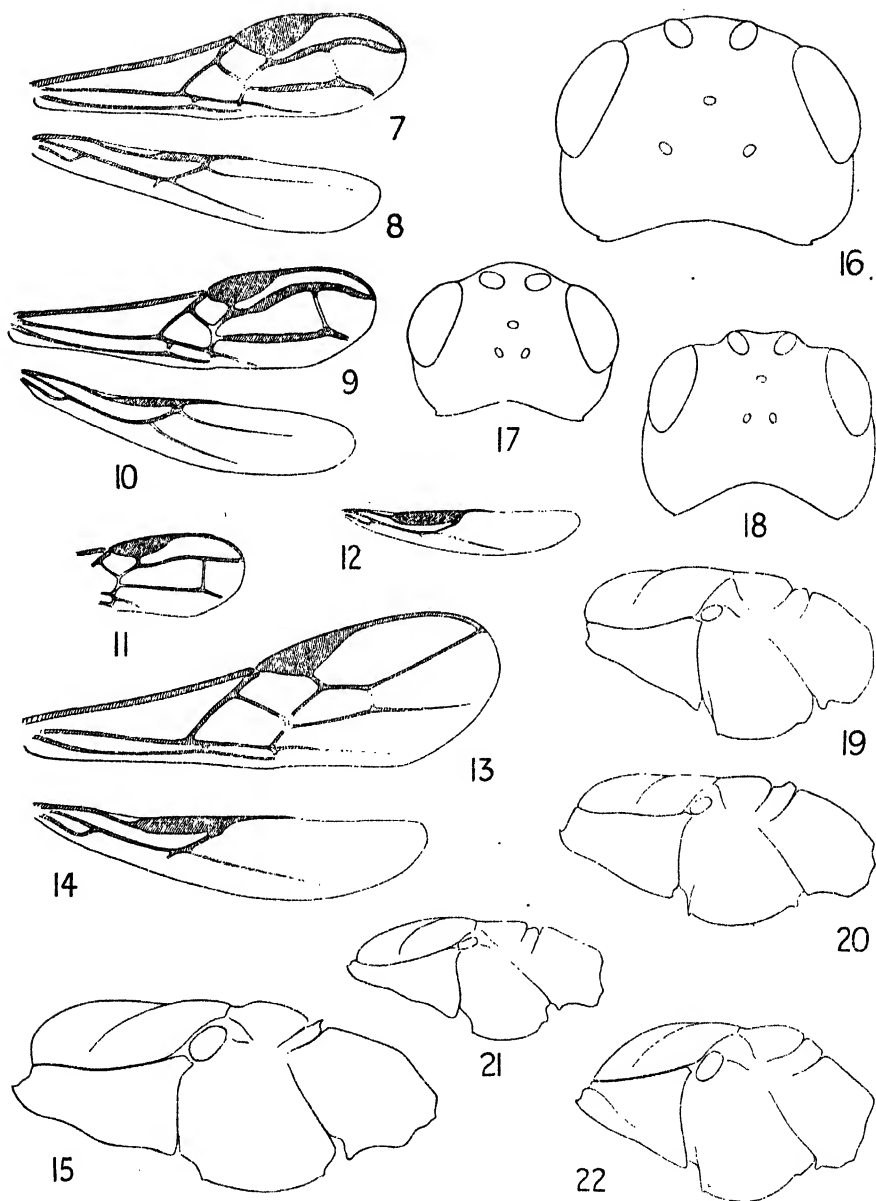
Apart from the differences mentioned in the key, the ♀ of *D. hartigii* has the ovipositor shorter, hardly two-thirds the length of the abdomen, and the ♂ has the front tibiae more curved than in *D. labdacus*.

Picard (1928) has discussed very carefully the so-called differences between *Caenopachys* Förster and *Dendrosoter* Wesmael, and has shown that for generic purposes they have no value. The reasons he gives for sinking *Caenopachys* under *Dendrosoter* seem to me to be very sound and I have accordingly followed him.

### *Dendrosoter thelepte* sp. n.

♂♀. Body predominantly honey-brown, the legs paler; the colour seems to be variable; usually the petiole, at least in the largest examples, is suffused with darker colouring; sometimes, too, the lobes of the mesonotum, especially the middle one of the ♀, has a blackish patch.

♀. *Head* not at all wider behind the eyes than across them (fig. 16). Vertex vaguely transversely aciculated; in small examples almost smooth. Antennae arranged in a triangle whose base is clearly longer than its sides. Antennae with 25-32 segments; funicle not obviously thickened towards apex; segment 1 very slightly longer than 2. Maxillary palpi long, fully twice as long as the greatest length of the eye. Temples and head behind the eyes, smooth. *Thorax*: Mesonotum somewhat truncate and gibbose in front (fig. 19); its lobes prominent, the notauli lying along deep furrows. The sculpture of the mesonotum consists of vague scaly-reticulation with a well-marked transverse tendency. Mesopleura, except the upper anterior impression, smooth and shining; sternauli represented by a smooth furrow. Propodeum with a fairly well-defined areola, which is open below, and with 2 large nearly smooth to smooth dorsal areas; the surface within the areola and elsewhere on the posterior face of the propodeum with raised rugosities. Fore-wings (see ♂). Legs: anterior tarsus not much longer than its tibia, about 9:7; segment 2



FIGS. 7-22.—7. *Dendrosoter hartigii* (Ratz.), fore-wing of ♂; 8. *D. hartigii* (Ratz.), hind-wing of ♂; 9. *D. labdacus* sp. n., fore-wing of ♂; 10. *D. labdacus* sp. n., hind-wing of ♂; 11. *D. labdacus* sp. n., section of fore-wing of ♀; 12. *D. middendorffii* (Ratz.), hind-wing of ♂; 13. *D. thelepte* sp. n., fore-wing of ♂; 14. *D. thelepte* sp. n., hind-wing of ♂; 15. *D. olynthus* sp. n., thorax of ♀ (lateral); 16. *D. thelepte* sp. n., head of ♀ (from above); 17. *D. olynthus* sp. n., head of ♀ (from above); 18. *D. labdacus* sp. n., head of ♀ (from above); 19. *D. thelepte* sp. n., thorax of ♀ (lateral); 20. *D. sipius* sp. n., thorax of ♀ (lateral); 21. *D. elegans* sp. n., thorax of ♀ (lateral); 22. *D. labdacus* sp. n., thorax of ♀ (lateral).

of the hind tarsi hardly more than half 1; outer side of the hind tibiae with semi-erect hairs which are about two-thirds the width of the tibia. *Abdomen*: Petiole very slightly longer than apically wide, striate-reticulate; in small examples the reticulate element is less in evidence. Tergite 2 with strong, often somewhat wrinkled striations over rather less than its basal half, though the actual extent of the sculptured area seems to be variable, both in length and breadth. Ovipositor slightly longer than the abdomen.

♂. Stigma of hind-wings between 5 and 6 times as long as wide (figs. 13, 14); recurrent nervure received into 2nd cubital cell by a distance equal to one-third, or less, of its own length. Tergites (2, 3) to 7 feebly excised.

Length: ♂♀, 2.6-4 mm. (excluding ovipositor of ♀).

UNITED PROVINCES: Dehra Dun, Jhajra, *Type loc.* (C. N. Chatterjee): 2 ♀♀ (Type ♀, 13.vii.1924), 9 ♂♂, bred June and July 1924 ex *Shorea robusta* Gaertn.; Dehra Dun, Golatappar (C. F. C. Beeson), 3 ♀♀, 3 ♂♂, bred Nov.-Dec. 1922 ex *Shorea robusta* Gaertn. The series from Golatappar comprises smaller individuals than that from Jhajra and is more marked with darker colouring.

### *Dendrosoter orithylus*, sp. n.

♀. Body brown; sides of thorax, scutellum and course of notauli a little darker. Front and middle coxae and all the trochanters testaceous. Petiole in one of the larger females from Port St. John suffused with black. The smallest female (Port St. John) is more or less uniformly brown and paler than the other four females. Stemmaticum same colour as the vertex. The 2 ♀♀ from Katberg are darker than the 2 larger ♀♀ from Port St. John and on tergite (2, 3) have a pale brown longitudinal band on each side and extending as far as the lateral suture. *Head* distinctly widened behind the eyes, but less so in the smallest female. Frontal callouses without raised cristulae forming darkened lines, their surface being clearly scaly-reticulate over its greater posterior part. Face rugulose, rugulosity with a weak transverse tendency. Vertex dull, finely rugulose, with an indication of fine wrinkles immediately behind the posterior ocelli. Temples and head behind the eyes dull, with fine surface sculpture (more or less scaly-reticulate) all over. Apart from the face, the head is almost glabrous. Antennae with 28-32 segments; funicle 1 slightly longer than 2. Maxillary palpi about three times as long as the greatest length of the eye. *Thorax*: Mesonotum sloping gradually to pronotum, not at all gibbose in front, as in the following species (cf. fig. 20); its hairs minute, adpressed and sparse; lobes somewhat raised; sculpture of mesonotum showing raised rugulosity on its sunken posterior area (much less in evidence in the smallest ♀), elsewhere dull, rugulose with a slightly transverse tendency. Mesopleura everywhere, apart from the upper anterior impression, dull, evenly scaly-reticulate; sternauli feebly crenate. Mesosternum (ventral to sternauli), beautifully and evenly scaly-reticulate. Propodeum elongate, somewhat flattened, dull, rugulose all over and without a trace of an areola. Fore-wings with fuscous cloudings (fig. 2); stigma yellowish on basal third. Legs: front tarsus not much longer than its tibia, about 6:5; hind coxae and all the femora, though to a less extent the front and middle pairs, dull, scaly-reticulate; segment 2 of hind tarsus about half 1; segment 3 of hind tarsus slightly shorter than 5; hind tibiae without outstanding hairs. *Abdomen*: petiole about  $1\frac{3}{4}$  as long as apically wide, with fine, irregular striations on a much-sculptured surface. Tergite 2 sculptured over fully  $\frac{3}{4}$  of its surface, at the sides almost to apex; the sculpture consists almost exclusively of fine punctate-reticulation, giving a shagreened effect; the two fused tergites are divided laterally by a short furrow. Ovipositor nearly  $\frac{3}{4}$  as long as the whole body.

Length: ♀, 3.8-4.8 mm. (without ovipositor).

CAPE PROVINCE: Pondoland, Port St. John (R. E. Turner), Nov.-Dec. 1923, 3 ♀♀ (one the type). E. CAPE PROVINCE: Katberg (R. E. Turner), Nov. 2 ♀♀.

***Dendrosoter sipius* sp. n.**

♀. Closely related to the preceding species and differing from it as follows:—

Light yellowish-brown, almost testaceous. Stemmaticum almost black. Prescutellar fovea sometimes blackish. Head not, or hardly widened behind the eyes. Sculpture of vertex, temples and head behind the eyes, hardly different from that of *D. orithylus*, though the vertex is without raised wrinkled rugulosity on the ground sculpture. Thorax (fig. 20): Segment 3 of the hind tarsus not at all shorter than 5; 2,  $\frac{2}{3}$  as long as 1; front tarsus longer in proportion to its tibia, about 35:21. Fore-wings yellowish, of paler tint than in *D. orithylus*, but showing a similar distribution of light and shade; almost basal half of stigma pale; 2nd abscissa of radius shorter (fig. 3). Abdomen: petiole distinctly shorter, being only a little longer than its apical width, its sculpture slightly coarser, best describable as striate-reticulate with the striate element predominating. Extent of sculpture on tergite (2, 3) much as in *D. orithylus*; sculpture itself striate-punctate, though at the sides, and especially beyond the short lateral suture, merely coarsely scaly-reticulate. Ovipositor about  $\frac{2}{3}$  as long as the body.

Length: 3-3.8 mm. (without ovipositor).

CAPE PROVINCE: Pondoland, Port St. John (*R. E. Turner*), Nov. 1923, Jan. 1924, 2 ♀♀ (Type ♀, Nov.).

This species and *D. orithylus* are probably characterised by their glabrous appearance, absence of cristulae on the frontal callouses, dull sculptured mesopleura and degree and extent of sculpture on tergite (2, 3) together with the short lateral furrow marking the division of this tergite into its two morphologically separate segments.

***Dendrosoter elegans* sp. n. (fig. 6).**

♀. Brown. Head, a large oblong patch on mesonotum, extending on to all the lobes, and tergite (2, 3) paler. Legs predominantly pale brown. Head clearly a little narrower behind the eyes than across them, rather strongly narrowed posteriorly. Vertex with a broad, shallow, longitudinal furrow; surface of vertex somewhat shining, very weakly rugulose with a transverse tendency. Temples and head behind the eyes more or less smooth and shining in one ♀, but with a feeble surface sculpture in the other. Ocelli arranged in a triangle whose base is very slightly longer than its sides. Frontal callouses with raised broken cristulae on about anterior half, and sharply margined on their inner side. Antennae with 31 segments; funicle 1 about as long as 2. Eyes small, virtually round, the shortest distance between them and the occipital margin about equal to their diameter. Maxillary palpi nearly as long as the front tarsus. Thorax of narrow build, markedly narrowed in front and behind (figs. 6, 1). Mesonotum sloping very gradually to pronotum, thickly clothed with short semi-adpressed hairs; its sculpture very fine, especially on the lateral lobes where it is closely scaly-reticulate; on the middle lobe, it is slightly stronger and shows a feeble transverse tendency. Mesopleura, except within the upper anterior impression, smooth and shining everywhere, strongly convex, almost gibbose above the sternauli, which show as a smooth deep cleft, deepest in the middle. Propodeum with a long, irregular, basal carina, but without a distinct areola, at least in the two females available; the two dorsal areas, which are nearly smooth and longer than wide, fall away roof-wise from the central carina. Fore-wings with faint yellowish suffusions; recurrent nervure in one ♀ (Mossel Bay) received, not into the apex of the 2nd discoidal cell, but outside it, on to the nervus parallelus (this is the wing shown in fig. 1); in the other ♀ (Katberg), it is more or less interstitial with the discoidal vein; 2nd abscissa of the radius not at all longer than the 1st intercubitus. Legs: hind coxae smooth; outer side of hind tibiae with long semi-erect hairs, which are hardly shorter than the width of the tibia; segment 2 of the hind tarsus less than half 1; front tarsus nearly twice as long as its tibia, about

30: 17; hind tibiae with 3 or 4 minute, hardly visible teeth on their outer margin. *Abdomen* almost petiolate (fig. 6). Petiole  $2\frac{1}{2}$  to 3 times as long as apically wide; feebly longitudinally striated on a rugulose surface, so that the sculpture appears indefinite in character. Following tergites smooth, at most the merest trace of striation at base of (2, 3). Ovipositor fully as long as the body.

Length: ♀, 2.7–3.3 mm. (without ovipositor).

E. CAPE PROVINCE: Katberg (*R. E. Turner*), Jan. 1933, 1 ♀ type; CAPE PROVINCE: Mossel Bay (*R. E. Turner*), March 1922, 1 ♀.

The long outstanding hairs of the hind tibiae and the virtual absence of sculpture on tergite (2, 3) are probably characteristic of the species.

### *Dendrosoter pallidistigma* sp. n.

This species is very naturally related to *D. elegans*. It is amply distinct from that species and differs from it as follows:—

Head almost yellow. Legs pale reddish-yellow. Mesosternum pale reddish-brown. Mesonotum without darker patches. Abdomen beyond tergite 2 (which in this case is sharply delimited) mostly yellowish. Altogether a much more brightly coloured insect than *D. elegans*. Head behind the eyes completely smooth and shining. Eyes considerably larger and more prominent than in *D. elegans*, though, as in that species, virtually round. Antennae broken but with at least 26 segments. Ocelli arranged in a virtually equilateral triangle. Mesopleura less convex in the middle. 2nd abscissa of the radius about  $1\frac{1}{2}$  times as long as the 1st intercubitus. Hairs of legs much shorter and by no means so conspicuous a feature of the species as in the case of *D. elegans*. Sculpture of petiole (which is about  $2\frac{1}{2}$  times as long as apically wide) slightly stronger and more irregular. Tergite 2 sharply delimited by being strongly sculptured everywhere; the sculpture consists predominantly of long irregular striations, the spaces between the ridges rugulose.

Length: ♀, 4.3 mm. (without ovipositor).

CAPE PROVINCE: Pondoland, Port St. John (*R. E. Turner*), April 1924, 1 ♀ type.

This and the preceding species form a natural group to which generic status will probably have to be given later. For the time being, however, I think it is better to leave them in *Dendrosoter* until some attempt has been made to place the already described Doryctine genera on a firmer foundation. The two species are characterised chiefly by their elongate form and narrow petiole.

### *Dendrosoter niger* Szepligeti.

*Dendrosoter niger* Szepligeti, 1914, *Mitt. zool. Mus. Berlin*, 7: 197.

Szepligeti's description suggests a relationship with *D. camerunus* End., with which his species may be identical. The similarity of data may be significant: *D. niger* has "Neu-Kamerun and Togo, (Conradt)" while *D. camerunus* has "Kamerun (Conradt)."

Type presumably in the Zoological Museum, Berlin.

### *Dendrosoter interstitialis* Szepligeti.

*Dendrosoter interstitialis* Szepligeti, 1907, *Bull. Mus. Hist. nat. Paris*, 13: 35.

Described from a single female from British East Africa.

From the fact of its having the recurrent nervure interstitial, this species may be related to *D. olynthus* and *D. camerunus*. Szepligeti himself says it is like *D. protuberans* (Nees).

Location of type unknown.

SOME NEW NEOTROPICAL SPECIES OF SCOLYTIDAE IN THE  
COLLECTION OF THE BRITISH MUSEUM\* (COLEOPT.)

By Karl E. SCHEDL.

Communicated by G. J. ARROW, F.R.E.S.

**Cnesinus coffeae** sp. n.

♀. Ferruginous, 2.5 mm. long, 2.7 times as long as wide. A very slender species with rather dull pronotum, striate-punctate elytra and inconspicuous pubescence. *Front* shining, transversely concave below, the fundus of the concavity covered with a plush of short erect reddish hairs, shining and impunctate between the subapproximate eyes. *Pronotum* as long as wide, base bisinuate, angulate in the middle, postero-lateral angles obtuse and not rounded, sides nearly straight and divergent on more than the basal half, regularly and broadly rounded in front, surface feebly convex, nearly opaque, densely strigose, the strigae confluent, the median line visible as a narrow elevated line on the basal half, with pale and scale-like hairs in the anterior third. Scutellum moderate in size and not impressed. *Elytra* on the junction with the pronotum much wider (47:40), in the middle feebly wider (50:47), sides 2.2 times as long as the pronotum, humeral angles rectangular, feebly rounded, sides subparallel on the anterior two-thirds, then gradually narrowed, the apex obtuse, declivity commencing far behind the middle, gradually convex, depressed on the two first interstices below, the third rather abruptly ascending on the inner side and gradually rounded towards the postero-lateral angles; disc narrowly striate-punctate, the striae moderately incised, the punctures indistinct, interstices rather wide and flat, densely reticulate-punctate; on the depressed portion of the declivity the two first interstices opaque, the sculpture more dense, the striae 1 and 2 narrow, feebly impressed and reaching the apical margin, the other interstices on the lateral convexities gradually narrowed, shortened, rugose and covered with sparse chaffy hairs.

What I believe is the male has the front dull, opaque, the anterior depression more shallow, with sparse pubescence, especially along the epistomal margin and on the sides of the depression.

*Type* and paratypes in the collection of the British Museum and paratypes in my own.

COLOMBIA: La Esperanza, 15.ii.1937, *K. P. Roba*, ex *Coffea arabica*.

**Phloeosinus neotropicus** sp. n.

♀. Pronotum piceous, elytra dark ferruginous, 2.9 mm. long, not quite twice as long as wide. This species, which is the first of the genus from the West Indies, belongs to the group of *P. canadensis* Sw., *P. scopulorum* Sw. and *P. rugosus* Sw. From its relatives it can be distinguished by the declivital armature, especially in the male. *Front* shining, plano-convex, densely rugosely punctured, with a fine median carina, eyes narrowly emarginate in front, antennal club long oval, nearly as long as the funicle and scape together, the sutures oblique; mesosternal piece between the coxae wide and broadly emarginate.

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\* 55th contribution on SCOLYTIDAE and PLATYPODIDAE.

*Pronotum* wider than long (70 : 45), when measured without the median projection on the base, the latter strongly bisinuate and medially angulate, sides convergent from the base to the apex, in broadly rounded arcuate lines, anterior constriction distinct, apical margin rather narrowly rounded, with a slight but distinct depression behind it; surface shining, very densely and deeply punctured, impunctate median line faint, pubescence inconspicuous. Scutellum extremely small. *Elytra* wider (80 : 70) and more than twice as long as the pronotum, widest at the middle, sides straight, broadly rounded at the apex, declivity commencing at the middle, uniformly convex; disc deeply but narrowly striate-punctate, the punctures somewhat ill-defined, interspaces convex, rather densely covered with transverse rugae; declivity with the interstices 1 and 3 more strongly convex and each with a row of tubercles, those of the third interstice placed, those of the suture remote, second interstice low, with fine punctures, all other interstices finely tuberculate, pubescence hair-like and inconspicuous.

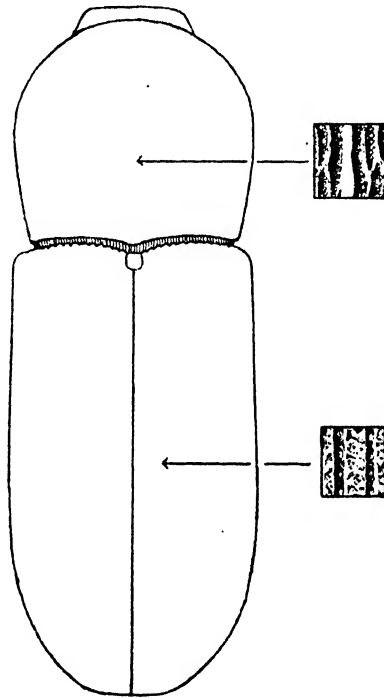


FIG. 1.—*Cnesinus coffiae* sp. n. ♀, outline and details of sculpture.

Compared with *P. rugosus* Sw. I find the following differences: *P. neotropicus* has the pronotum much more strongly punctured, the elytral striae are deeper and wider, the rugae of the interstices shorter and better defined, the tubercles of the first declivital interstice are much more remotely and somewhat irregularly placed.

♂. Front transversely depressed below, the median carina more distinct, the elytra more coarsely sculptured, first declivital interstice with three to four closely placed pointed tubercles, which increase in size towards the apex, on the remaining space with two very irregularly placed additional tubercles, fifth and seventh interstices each with a row of closely placed granules.



In *P. rugosus* Sw. the declivity is much more abruptly convex, the tubercles regular in arrangement, closely placed and with scale-like pubescence.

*Type* in the British Museum (♀) and paratype in my own collection (♂).  
JAMAICA : Cinchona, 1.viii.1923, C. C. Gowdey.

### **Hypothenemus cryphalomorphus sp. n.**

Dark ferruginous, summit of the pronotum somewhat brighter, 1.4 mm. long, 2.1 times as long as wide. The general appearance is exactly as in the genus *Cryphalus* Er. *Front* subshining, transversely depressed below, with a transverse carina above, finely punctured. *Pronotum* wider than long (34 : 25), widest at the base, sides subparallel on the basal third, broadly rounded in front, anterior margin with four closely placed subequal teeth; summit high, transversely depressed behind, anterior area with few but rather coarse asperities, subshining and indistinctly punctured on the basal half. *Elytra* but little wider and twice as long as the pronotum, sides parallel on more than the basal half, broadly rounded at the apex, declivity short, evenly convex, subshining, with indistinct rows of fine punctures, pubescence scale-like and arranged in distinct rows (in one specimen abraded).

*Type* and paratypes in the British Museum and paratypes in my collection.  
BRITISH WEST INDIES : Trinidad, Fry Coll.

### **Xyleborus artecuneolus sp. n.**

♀. Ferruginous, 2.6 mm. long, 2.3 times as long as wide. Rather closely related to *X. metacuneolus* Egg. and *X. mangoensis* Schedl. *Front* plano-convex, rugosely and coarsely punctured, medially with a low tubercle. *Pronotum* feebly wider than long (60 : 53), globose, base transverse, postero-lateral angles rectangular and feebly rounded, sides subparallel on the basal half, semicircularly rounded in front, anterior margin with several low and subequal asperities; summit in the middle very high, anterior area steeply convex, densely covered by small asperities, posterior area subshining, minutely reticulate, rather coarsely but shallowly punctured; anterior margin feebly produced downwards when viewed from the front. *Elytra* not quite as wide (at the base) and 1.6 times as long as the pronotum, humeral angles feebly rounded, sides subparallel on the basal two-thirds, thence obliquely convergent, apex narrowly rounded, declivity commencing somewhat before the middle, gradually and obliquely convex, aplanate in the lower half; disc striate-punctate, striae feebly impressed, the punctures moderate in size, rather shallow and closely placed, interspaces subconvex, each with a row of much more remotely placed punctures, these larger and rather irregular in arrangement near the base and the suture; declivity with the apical margin acute, the suture feebly elevated on the aplanate portion, the first row deeply impressed, the third interstice as high as the first, the three first interstices each with a row of small tubercles.

*Type* and paratypes in the collection of the British Museum and paratypes in my own.

TRINIDAD, F. W. Ulrich, 1914.

### **Metacorthylus ingaensis sp. n.**

♂. Piceous, 1.8 mm. long, 2.1 times as long as wide. *Front* convex, sparsely, rather coarsely punctured. Antennae with the scape short and stout, clubbed at the apex, funicle with one single joint, the club rather large but much smaller than in the female, outline as in the figure below, with one septate suture and a second one indicated. *Pronotum* but little

longer than wide (46 : 44) without the anterior teeth, base transverse, postero-lateral angles rectangular and acute, sides parallel on the posterior half, thence obliquely convergent, apex rather narrowly rounded, medially armed with two very slender recurved tooth-like asperities; summit in the middle, anterior area with sparsely placed and very small asperities, posterior area silky shining, without punctures but with some transverse wrinkles in the continuation of the anterior asperities. Scutellum large and triangular. *Elytra*

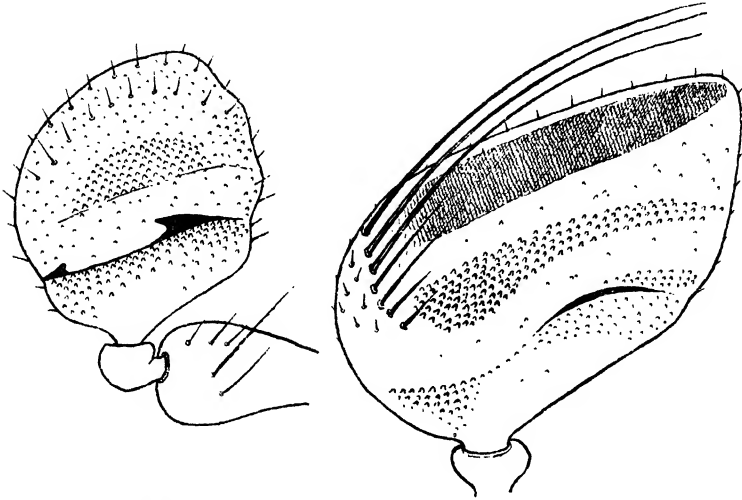


FIG. 2.—*Metacorthylus ingaensis* sp. n., antennae, left ♂, right ♀.

feebly wider (before the declivity) and 1.1 times as long as the pronotum, sides straight, broadly and abruptly rounded in the apical fourth, declivity very steep and convex; cylindrical, shining, with some very fine punctures and transverse wrinkles but without visible striae; declivity subperpendicularly convex, the suture finely carinate, depressed along the second interstice, the third interstice elevated and with three granules, apex acute and margined up to the seventh interstice. Fore tibia dentate on its outer margin.

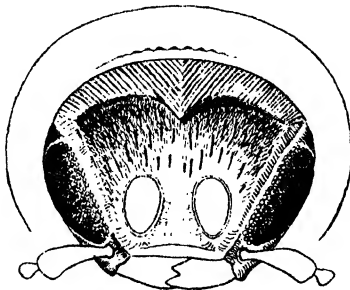


FIG. 3.—*Metacorthylus ingaensis* sp. n., head of ♀.

♀. Of similar size and proportions, the head excavate, with a fringe of long hairs on the upper margin, smaller hairs on the sides, the fundus of the cavity with two egg-shaped bright yellow spots, presumably secretory organs, and few chaffy hairs above; antenna

with the club much wider than long, somewhat similar to that of *Corthylus panamensis* Blandf., outline as in fig. 2, the first segment limited by a partly septate suture, with two transverse bands of sensory papillae, the superior edge with a thin flagellum of fine cirrhi curving round the apex and about as long as the club. Pronotum with the anterior margin more broadly rounded, the apical serrations low and numerous, the elytral declivity more coarsely sculptured on the sides below.

The smallest species of the genus, especially characterised by the front of the female.

*Type* and paratypes in the collection of the British Museum and paratypes in my own.

COLOMBIA : El Collegio, 7.vii.1937, *R. P. Roba*, in branches of *Inga* sp.

#### BOOK NOTICE.

*Die Tierwelt Deutschlands und der angrenzenden Meeresteile.* Teil 35. Flöhe (Aphaniptera), Läuse (Anoplura). Von O. JANCKE. pp. 78, 47 figs., 1 map. Jena (G. Fischer), 1938. Price Rmk. 7.50.

This part of the "Tierwelt Deutschlands" follows the plan of preceding parts of the series. The Aphaniptera are dealt with on pages 1-42, and the Anoplura on pages 43-78.

Each Order is treated the same; the treatment opens with a bibliography, and a list of abbreviations, followed by a key to the genera, and individual description of the species occurring in Germany.

To each Order is given a list of species arranged by their hosts and, for the Fleas, a list of species likely to be found but not yet recorded in Germany, is given.

#### BOOK NOTICE.

*De Danske Storsommerfugle i deres Udbredelse i Nordøsttersøomraadet.* By S. HOFFMEYER and S. KNUDSEN. Aarhus (Universitetsforlaget) and København (C. A. Reitzel). pp. 310, 8 pls., 1 map. 1938.

This book treats of the Macrolepidoptera of Denmark.

It is based on published records mainly, and these are quoted after the name of the species. The records of Jutland species is given more exactly by reference to the three zones, eastern, central, and western Jutland. The records of distribution in the remaining Danish areas are given and finally the distribution is given, in abbreviated form, for the whole North Sea and Baltic Sea areas, including Great Britain.

The book is written in Danish, but a list of the more frequently occurring words with their German equivalent is given.

Four new aberrations are described in this book.

An index to species and lower classes is given, as is a list of localities.

# A NEW EAST AFRICAN *AÈDES* (DIPT., CULICIDAE)

By F. W. EDWARDS, M.A., Sc.D., F.R.E.S.

## *Aedes* (*Finlaya*) *pulchrithorax* sp. n.

An extremely distinctive species, with markings much as in *A. barnardi* Edwards, but much more sharply defined and contrasted black and white; differs from *A. barnardi* and related African species of the subgenus *Finlaya* in having hind femur black at base and hind tibia white at base beneath, and in several other details. Mesonotum black, with three rather narrow straight lines of narrow yellowish-white scales, median line running whole length and forking in front of scutellum. Anterior and posterior pronotal lobes with flat silvery-white scales. Abdomen black, segments with silvery-white lateral basal spots. Tarsal markings as in the *A. wellmani* group.

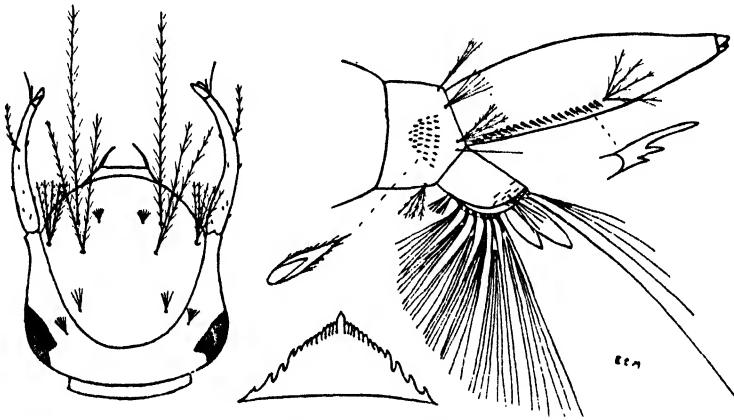


FIG. 1.—*Aedes* (*Finlaya*) *pulchrithorax* sp. n.

KENYA: Nairobi (*Miss E. C. Macdonald*).

Types presented by the collector to the British Museum.

The thoracic markings are strikingly similar to those of *Culex pulchrithorax* Edw. A fuller description and figure will be given in my forthcoming monograph of the Ethiopian Culicine mosquitoes.

## THE LARVA OF *AÈDES* (*FINLAYA*) *PULCHRITHORAX* EDWARDS (DIPT., CULICIDAE)

By (Miss) E. C. MACDONALD.

(*The Medical Research Laboratory, Nairobi.*)

DESCRIBED from 20 pelts and 12 whole larvae.

Length 6 mm. Colour dark; head and siphon very dark.

*Head.* Antenna infusate throughout its length and sparsely spiculate. Tuft a single or two branched, fairly long, finely plumose seta placed just beyond a half. Seta A with

4-6, usually 5, finely plumose branches about half the length of C; B a single finely plumose seta about the length of the head; C 2-3 branches, usually 2, finely plumose, nearly two-thirds B and placed slightly internal and very close to B and almost in a line with A. d small, many branched and placed in a line with B. e with 4-5 branches slightly longer than f which has 10-15 branches. Mentum with 13 teeth on each side of a large central tooth and increasing in width of spacing towards the base.

*Abdomen.* Comb a semi-circular patch of 24-29 finely fringed, sharp pointed spines. Siphon very dark with an index of about 4. Pecten composed of 20-25 dark, well-sclerotised spines none of which is markedly wider spaced and reaching to a little beyond a half. Each individual spine with 2-3 basal denticles. Subventral tuft of 4-5 sparsely plumose branches about the length of the diameter of the siphon and placed just beyond the pecten. Anal segment with almost complete saddle; the upper distal margin with small spicules. Upper caudal seta with 4-6 branches, usually 4, and the lower single. Lateral seta with 4-6 simple branches, much shorter than the saddle. Brush composed of 6 pairs of tufts with 4-7 simple branches. Two small tufts outside the barred area. Gills short, bluntly lanceolate; dorsal pair about as long as saddle; ventral pair considerably shorter.

Found breeding in tree holes in the City Park and the Arboretum, Nairobi. The trees were "Mutanga" (*Elaeodendron* sp.) and *Linociera* sp.

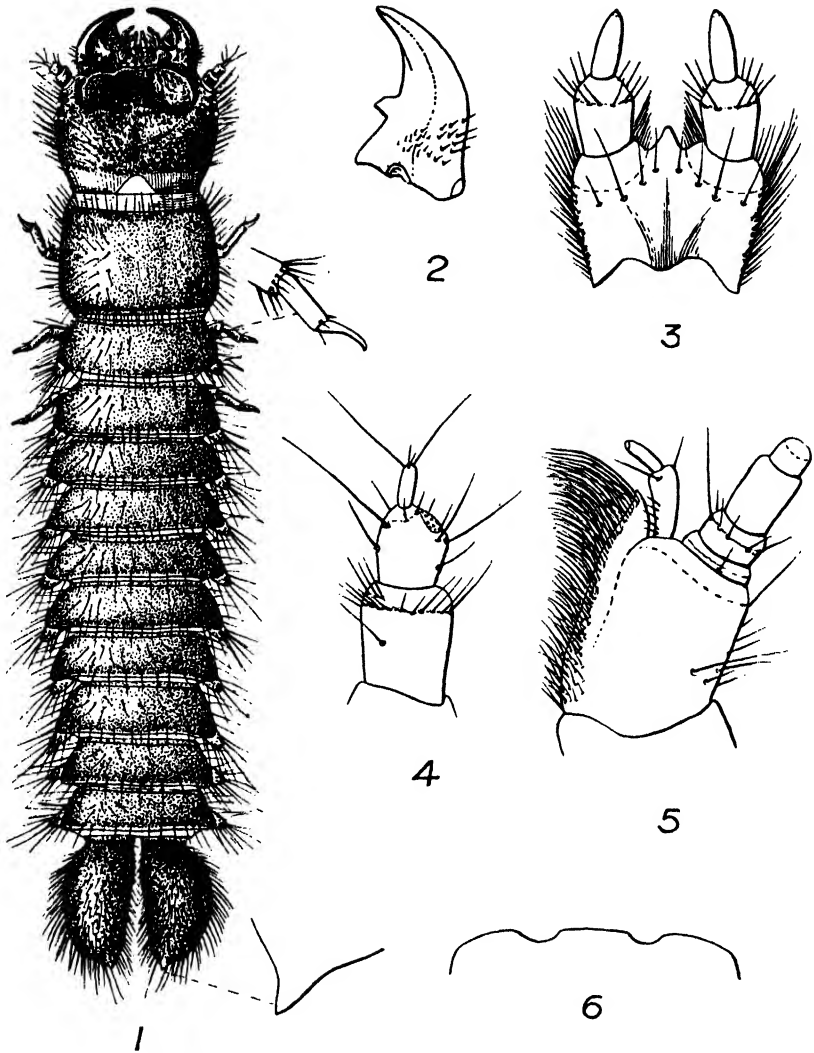
## THE LARVA OF *ANTHIA SEXGUTTATA* (FAB.) (COLEOPT. CARABIDAE)

By J. C. M. GARDNER, F.R.E.S.

(Forest Research Institute, Dehra Dun, U.P.)

THE larva of *Anthia* was unknown until Chopard and Jeannel recently succeeded in rearing *Anthia sexmaculata* (Fab.), an Algerian species, after years of failure. Chopard (1) gave an excellent illustrated description, and Jeannel (2) comments on certain peculiarities, of the larva. Later, van Emden (3) discussed those two papers and indicated the diagnostic characters of the Anthiini.

The discovery of the larva of another species, *Anthia sexguttata* (Fab.), is of interest in the circumstances. In 1938, a field party from the Forest Research Institute under Mr. R. N. Mathur was engaged in investigating defoliation problems in the plantations of *Dalbergia sissoo* in the sandy areas of Chichawatni, Punjab. Among the miscellaneous insects collected were numerous (about 100) adults of *Anthia sexguttata* and four carabid larvae which show all the generic and tribal characters indicated by Chopard and by van Emden. There can be little doubt that larvae and adults are of the same species. Efforts had been made to rear the larvae but on their death they had been preserved in alcohol. The larvae were in fairly good condition, but rather distorted and probably discoloured. Three larvae are about 25 mm. in length; the fourth was in pre-pupal condition and about 35 mm. in length, smaller than would be expected in relation to the size of the adult; the discrepancy is probably due to the artificial conditions in which the larva had been kept before its death.



FIGS. 1-6.—*Anthia sexguttata* (Fab.) larva. 1, larva in dorsal view (part of leg and apex of urogomphus shown enlarged); 2, mandible; 3, labium in ventral view; 4, antenna; 5, maxilla; 6, anterior margin of frontal plate.

Head and urogomphi black; pronotum dark castaneous, the following terga castaneous (reddish testaceous in one of the smaller specimens); ventro-lateral projections from mesothorax to eighth abdominal segment castaneous; undersurface pale with testaceous plates; the two posterior sterna with larger and darker plates; setae dark reddish. Body nearly parallel-sided, moderately depressed.

Head wider than long, with a shallow transverse groove before the basal emargination; anterior to this groove is a transverse series of erect setae, laterally are numerous rather long setae each arising from a basal granule; epicranial suture distinct. Six ocelli on each side. Frontal plate depressed medially, the anterior margin (fig. 6) with a wide, weakly produced nasale with nearly straight edge. Antenna (fig. 4) three-segmented, black;

basal segment not much longer than wide; the second about as long as wide, with a large slightly convex sensory cushion apically; the third segment slender, more than twice as long as wide, borne eccentrically on the apex of the second segment. Mandible (fig. 2) rather stout, with stout tooth a little behind the middle; with numerous setae on outer surface. Maxilla (fig. 5) black, the stipes only slightly longer than wide; the inner margin produced apically into a stout continuous lobe and with a dense fringe of reddish setae for its whole length; galea with two elongate articulated segments, the basal one the longer; palp stout, four-segmented, the two basal segments strongly transverse, the third cylindrical, distinctly longer than wide, the fourth short and blunt. Labium (fig. 3) with prominent ligula which bears no apical setae (but there are two small setae on its dorsal surface well behind the apex); the palps each with a stout basal segment, slightly longer than wide and a slender apical segment.

Pronotum moderately transverse; the following ten terga strongly transverse, rounded laterally, the posterior angles very slightly prominent; each with a posterior marginal series of rather longer stiff setae as well as some anterior setae. Each segment from mesothorax to eighth abdominal with a stout finger-like projection, with numerous setae, from below the spiracular level on each side. Anterior abdominal sterna with small plates bearing numerous rather long, backwardly directed setae; eighth and ninth sternum with large transverse plates, the posterior one curved behind.

Urogomphi separately movable basally, with rigid integument; approximate; extremely stout, ovoid, about twice as long as greatest width, slightly constricted at base and gradually narrowed towards the apex which carries a small distinct tooth; the surface with numerous reddish setae arising from basal granulations; the urogomphi are almost circular in cross-section. Legs well developed, each with a single rather slender claw which has two fine setae near the base.

The larva of *A. sexmaculata* (Fab.) as described by Chopard has comparatively long and slender urogomphi, the second segment of the antenna is elongate and the tarsal claw appears to be much more slender than in *A. sexguttata*. I have not found in the latter the long seta, regarded by Jeannel as a second claw, which is present above the claw in the Algerian species.

As van Emden has shown, the tribe Anthiini has much in common with the Helluonini both in larval and adult stages. In Helluonini larvae the basal segment of the galea is not articulated basally and is continuous with the stipes (its shape suggests that it might be derived from a fusion between the free basal segment and the distal projection of the stipes in the Anthiine larva); the antennae are four segmented and the legs have two claws.

#### REFERENCES.

- (1) 1936, La larve de l'*Anthia sexmaculata* F. *Bull. Soc. ent. Fr.* 41 : 168-173, 10 figs.
- (2) 1936, Les caractères larvaires des *Anthia* Weber. *Bull. Soc. ent. Fr.* 41 : 174-176.
- (3) 1937, On the larval characters of *Anthia*. *Ent. mon. Mag.* 73 : 58-61.

## A NOTE ON THE GENERIC CHARACTERS OF *ICTINOGOMPHUS* COWLEY (ODONATA)

By Lt.-Col. F. C. FRASER, I.M.S. Retd., F.R.E.S.

UNDER the old Selysian classification, *Ictinus* (= *Ictinogomphus* Cowley) was treated as a subgenus of genus *Lindenia*, and was divided up into three Groups—*decoratus*, *clavatus* and *ferox*. For this latter purpose, colour differences were mainly employed, that is, the relative preponderance of the black ground colour and the yellow markings. Some venational characters in one group and the armature of the female occiput in the others were also employed but in a subsidiary sense.

A division based on colour differences, which were more of a specific than generic nature, was not altogether satisfactory, and the need for more decisive definitions has since been stressed by several authors.

Hagen, in 1857, *Monographie des Gomphines*, gave short descriptions and moderately good figures of the genitalia of Groups *decoratus* and *clavatus*, but for some unexplained reason, which may have arisen from a desire not to tamper with the unique specimen from the Paris Museum, failed to give that of the third Group *ferox*.

Recently, whilst engaged in an examination of the genitalia throughout the whole family GOMPHIDAE, my attention has been called to the wide differences existing between the penes of these three Groups; so wide, in fact, that no modern systematist would hesitate in coming to the conclusion that he was here dealing with three separate genera. For establishing three such genera, I propose here to employ the genitalia, together with some other anatomical and venational differences, which have been found by a comparison of the various species of the genus *Ictinogomphus*.

### *Ictinogomphus* Cowley (fig. A).

A genus of very robust species; subtriangle made up of 3 cells, very rarely, and then abnormally, of 2 cells (in only one specimen of *I. ferox* have I found a subtriangle of 2 cells); discoidal field with 2 or 3 rows of cells, usually 3 rows; anal-loop made up of 5 to 6 cells; tornal angle produced, its sides enclosing an acute angle; lateral borders of segment 8 enormously dilated. Penis with first and second segments of equal length; glans short, with ventral spine but without terminal flagella.

Distribution: Ethiopian. Includes two species only, *ferox* (Rambur) and *pugnax* (Selys).

Genotype: *Ictinus ferox* Rambur.

### *Indictinogomphus* gen. n. (fig. C).

A genus of less robust species; subtriangle made up of 2 cells only; discoidal field with only 2 rows of cells; anal-loop made up of 4 cells only; tornal angle not produced, its sides enclosing a right or slightly obtuse angle; lateral borders of segment 8 only moderately dilated. Penis with first and second segments of equal length; glans short, without a ventral spine or terminal flagella, deeply fissured horizontally and with two long divaricate spines springing from the lower lip of the fissure.

Distribution: Oriental, from India to the Philippines and throughout the Sondaic archipelago to as far as Borneo and Australia. Includes *rapax* (Rambur), *fallax* (Selys), *tenax* (Selys), *annulosus* (Selys), *atrox* (Selys), *pertinax* (Selys), *decoratus* (Selys), *melanops* (Selys), *acutus* (Laidlaw), *australis* (Selys) and *celebensis* (Schmidt).

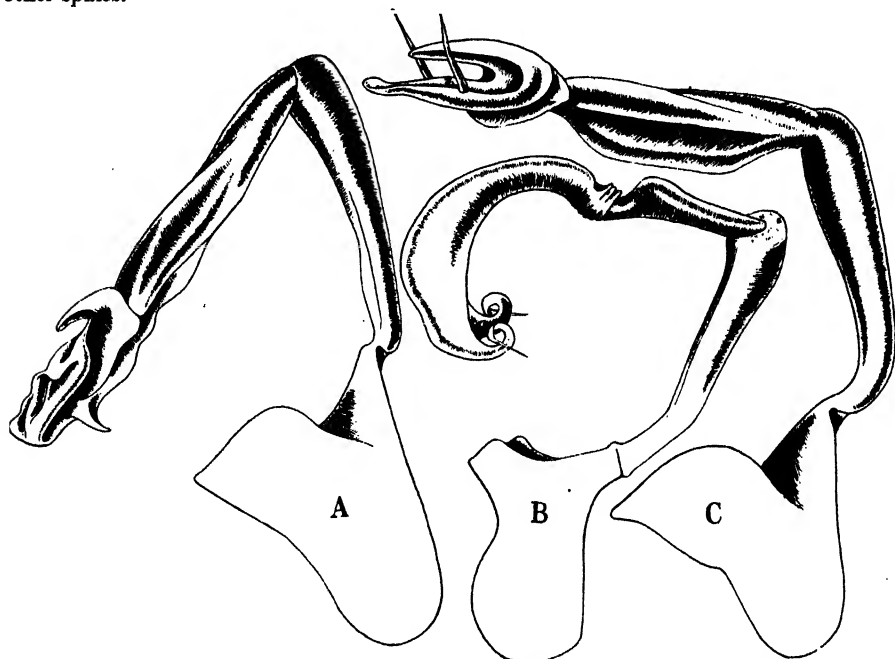
Genotype: *Diastatomma rapax* Rambur.

PROC. R. ENT. SOC. LOND. (B) 8. PT. 2. (FEB. 1939.)



***Sinictinogomphus* gen. n. (fig. B).**

A genus consisting of one very robust species with the subtriangle made up of only 2 cells; discoidal field with only 2 rows of cells; anal-loop made up of 3 cells only; tornal angle not produced, its sides enclosing a slightly obtuse angle; lateral borders of segment 8 enormously dilated. Penis with second segment only half the length of first; glans of great length, bifurcated at apex and ending in two long coiled flagella, without ventral or other spines.



FIGS. A-C.—Penile organs of: A. *Ictinogomphus ferox* (Rambur); B. *Sinictinogomphus clavatus* (Fabr.); C. *Indictinogomphus rapax* (Rambur).

Distribution: East and south-east Asia. Includes only a single species *clavatus* (Fabr.). *I. phaleratus* Kirby is here considered an undoubted synonym of the former.

Genotype: *Aeshna clavatus* Fabr.

In 1934, *Fauna of British India, Odonata*, 2: 370, I placed the two genera *Ictinus* and *Gomphidia* Selys in a new subfamily which I called ICTININAE, but since Cowley has shown that the name *Ictinus* is preoccupied and has renamed *Ictinus*, this subfamily now becomes ICTINOGOMPHINAE and will include the genera *Ictinogomphus*, *Indictinogomphus*, *Sinictinogomphus*, *Gomphidia* and *Cacus*.

*Ictinogomphus* and *Gomphidia* approach each other in the two species *I. tenax* (Selys) and *G. kirschii* Selys. *I. tenax* is an aberrant species and is remarkable for possessing an inferior anal appendage with the branches parallel instead of divergent as in the rest of the genus, except *I. celebensis* (Schmidt). The lateral expansions on the sides of segment 8 are very poorly developed and approach the condition found in *Gomphidia*. In *G. kirschii* the superior anal appendages are subcylindrical as in *Ictinogomphus* and thus differ from other species in the genus in which they are compressed. It is a coincidence

that these two aberrant and converging species should both be restricted to the Philippines and it suggests hybridism. I have not had the opportunity of studying the penis of *I. tenax*, but that of *G. kirschii* I find to be typical for *Gomphidia*. It may become necessary to erect a new genus for the two species *I. tenax* and *I. celebensis*.

**LIBELLAGO ADAMI, A NEW SPECIES OF DRAGONFLY FROM  
CEYLON (ODONATA)**

By Lt.-Col. F. C. FRASER, I.M.S. Retd., F.R.E.S.

AMONG a large number of specimens of *Libellago* which I collected in Ceylon in 1932, I find a single male which is evidently closely allied to *L. lineata asiatica* Fraser, but which bears the general colouring and facies of *L. finalis* Selys, although considerably smaller. This species, which is undoubtedly new,

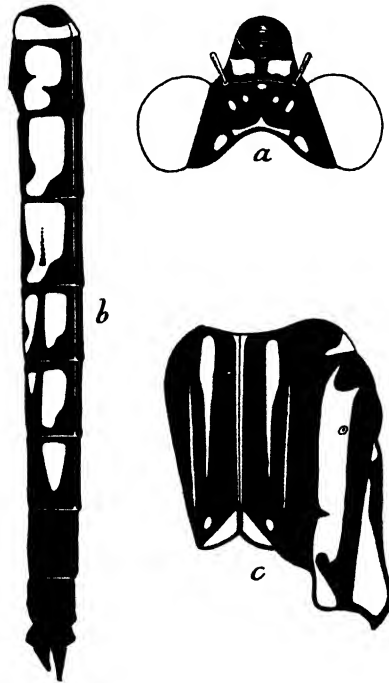


FIG. 1.—*Libellago adami* sp. n., a. Head, b. Latero-dorsal view of abdomen, c. Dorsum and right side of thorax to show markings.

now brings the number belonging to genus *Libellago*, found in Ceylon, to four, in contrast to only a single species for the whole of continental India. This striking development of *Libellago* in the island, is paralleled to an even greater degree by the PLATYSTICTIDÆ, and is a typical insular character. If, as is to be suspected, the whole of the Ceylon *Libellagos* have originated from the

widely distributed species *L. lineata lineata* (Burm.), then, judging from the wide differentiation attained by the various species, the separation of the island from the main continental mass of India must be of a greater age than was suspected.

### *Libellago adami* sp. n.

Male: abdomen 14 mm. Hind-wing 18 mm.

Head: labium a dirty yellow; labrum glossy black; eyes olivaceous clouded in parts with brown, this latter with a violet reflection. Rest of head velvety black marked with citron yellow as follows: the genae and a short stripe running up on the inner sides of the eyes, two very large reniform spots on the frons, a small rounded spot on the outer side of the ocellar area, a large oval spot on each side of the occiput, narrowly separated from a stripe which runs between them and sends a small point forwards at its centre.

Prothorax velvety black marked with a narrow citron yellow collar anteriorly, a large rounded spot on each side and an oval spot on the summit of the posterior lobe, which latter is clothed with long hairs. Thorax velvety black marked with citron yellow as follows: the mid-dorsal carina finely, an antehumeral stripe which is incomplete above and broadens rather abruptly below, a fine humeral line incomplete above and below, the alar sinus and a small rounded spot in front of each outer angle, a broad, irregular fascia on the mesepimeron and the greater part of the metepimeron. Legs black, femora chalky-white on the under surfaces.

Wings hyaline but the apices of the fore-wings very broadly tipped with black, which has a steely-blue reflection and extends proximally to well inside the end of pterostigma of hind-wing, when the two wings are apposed. Pterostigma present only in the hind-wings, black, covering 3 cells. Hind-wing tinted with yellow, this colour deepest at base and gradually fading out towards the apex of wing. Antenodal nervures 6 and 5 in fore- and hind-wings, 10 to 11 postnodals in hind-wing. Petiolation in fore-wing well proximal of level of basal antenodal, but only slightly so thereof in the hind-wing.

Abdomen velvety black, with markings, which are a beautiful grass-green on dorsum and golden-yellow laterally, on segments 1 to 7 shaped as shown in the accompanying text-figure, and closely copying the same markings in *L. lineata asiatica* Fraser.

Anal appendages black, not differing from those of *L. lineata lineata* (Burm.).

Habitat: A single male CEYLON: Harigama, 7.v.32, the type, now in my collection. The specimen was taken in company with *L. greeni* Laid., and *L. finalis* Selys, all perched on the ends of twigs overhanging a mountain stream. The species is named after Adams Peak.

This new species is most closely related to *L. lineata asiatica*, a common species throughout southern India but rare in Ceylon. It is to be distinguished from it by the much broader apical marking of fore-wings and by the brilliant grass-green colouring of the dorsum of abdomen.

From *L. greeni*, the colour of the abdominal markings will at once distinguish it, these being bright brick-red in *L. greeni*.

From *L. finalis*, which is a much larger species, it is distinguished by the much broader head markings, by the humeral stripe incomplete above and by the colour of the hind-wings, which are evenly and rather deeply enfumed throughout in *L. finalis*.

# A REVISION OF THE MALAYAN SPECIES OF *MILETUS* HÜBNER (= *GERYDUS* BOISDUVAL) (LEPIDOPTERA: LYCAENIDAE)

By A. Steven CORBET, D.Sc., Ph.D., F.R.E.S.

REVISIONAL papers by Fruhstorfer (1913, *Z. wiss. Insektenbiol.* 9 : 242-247; 10 : 307-310; 11 : 341-344), in which many new forms were described, formed the basis of his remarkably accurate monograph on the Indo-Australian Lycaenid genus *Miletus* Hbn. (= *Gerydus* Bsdv.) in Seitz, 1916, *Grossschmett. Erde* 9 : 815-823. The Javanese species have been listed by Toxopeus (1929, *Tijd. Ent.* 72 : 244).

Certain of the *Miletus* species exhibit so high a degree of individual and geographical variation that determination, particularly in the case of females, may be difficult. As little information is available concerning the male genitalia, the opportunity has been taken of revising the genus on this basis. It will be seen from the figures that the structure of the genitalia separates the genus into four rather well-defined groups :—

(a) clasper terminating in a broad lobe, with a small terminal hook; aedeagus strongly curved : *croton*, *gaesa*, *learchus*, *fictus*, *gaetulus*, *archilochus*, *boisduvali*, *longeana* and *biggsii*.

(b) clasper tapering and terminating in a broad, blunt hook; aedeagus comparatively broad and only slightly curved : *zinckenii*, *symethus*, *gigantes*, *ancon* and *gallus*.

(c) clasper narrowing gradually and terminating in a bent, rather rectangular, bifid process; aedeagus straight, rather broad and slightly tapering : *melanion*.

(d) clasper leaf-like, tapering towards its extremity and with lateral folding in the distal half; aedeagus almost straight, comparatively broad, and only slightly tapering at its distal end : *heracleion* and *leos*.

The synonymy of the genus appears to be as follows :—

*Miletus* Hübner, 1819, *Verz. bek. Schmett.* : 71. Type (cited in 1852, Doubleday, Westwood & Hewitson, *Gen. diurn. Lep.* 2 : 502) = *Papilio symethus* Cram., 1779.  
*Symetha* Horsfield, 1828, *Descr. Cat. Lep. Mus. E. I. Co.* : 59, pl. ii, f. 2. Type = *S. pandu* Hsf., 1828 (= *P. symethus* Cram., 1779).  
*Gerydus* Boisduval, 1836, *Spec. Gén. Lép.*, Atlas, pl. xxiii, f. 2. Type = *P. symethus* Cram., 1779.

Key for the separation of the Malaysian species of *Miletus*.

- 1 (6). ♂ upF vein 4 not thickened at the base.
- 2 (3). Up dark brown and unmarked but, occasionally, ♀ has faint indications of discal fascia on F . . . . . *gaesa*.
3. UpF with white discal area.
- 4 (5). UpF with a white discal band extending from costa to space 1b : very like *biggsii* but the white area in space 1b is not half as long as that in space 2 and the un markings are not outlined with whitish . . . . . *fictus*.
5. UpF with white discal area extending to wing base : upH white with narrow dark brown bordering . . . . . *gaetulus*.
6. ♂ upF vein 4 thickened at the base.
- 7 (8). ♂ up uniform dark brown, with pale straw-coloured sex stripe along vein 4 on F. ♀ up with very diffuse discal band comprising separated straw-coloured spots arranged as in *boisduvali* ♂ . . . . . *archilochus*.

8. UpF with a white discal band which, in some species, extends to the wing base.
- 9(10). UpF cell entirely brown. ♂ upF discal band narrow and diffuse, comprising separated spots in spaces 1b, 2 and 3, the last extending into space 4. ♀ upF with the outer edge of the discal band regularly curved, and convex towards the termen . . . *boisduvali*.
10. UpF cell partially white.
- 11(14). UpF with outer edge of white discal area not right-angled at vein 3.
- 12(13). UpF white discal band comparatively narrow and rather lenticular. In f. *atomaria* the whole of the discal band is dark dusted . . . *biggsii*.
13. UpF white discal area extending to the wing base : upH dark brown . . . *zinckenii*.
14. UpF with outer edge of white discal area right-angled at vein 3 and the white area in spaces 1b and 2 extended towards the termen.
- 15(18). UpF with more than half the wing area pure white.
- 16(17). UpH costal area dark brown and discal area whitened on a dark-grey ground . . . *symethus*.
17. UpH entirely white . . . *gigantes*.
18. UpF with the white area restricted to the discal band.
- 19(20). UpF white discal band almost separated into two portions by a dark wedge extending from the base into space 2 . . . *ancon*.
20. UpF discal band not nearly separated into two portions by a dark wedge.
- 21(22). UnF with the white spot in space 1b not separated from the upper portion of the discal band . . . *gallus*.
22. UnF with the white spot in space 1b separated from the upper portion of the discal band . . . *heracleion*.

### *Miletus gaesa gaesa* (Nic.).

*Gerydus gaesa* de Nicéville, 1895, *J. Bombay nat. Hist. Soc.* 10 : 26, pl. S, f. 16 ♂; ♂♀, North-east Sumatra, Battak Mountains.

*G. learchus gaesa* Fruhstorfer, 1916, in Seitz, *Grossschmett. Erde* 9 : 816, pl. 141 f 4 ♂.

It seems probable that *M. gaesa* replaces the Philippine species *M. learchus* Feld. & Feld. in Sumatra and south-east Asia. Malayan and Sumatran forms hardly differ, but the Tonkin subspecies *gethusus* (Fruh.) has more angulated wings. The male holotype of *carrinas* (Fruh.), from Sintang, Borneo, which was described as a race of *learchus*, has been ascertained to be a form of *M. boisduvali* Moore.

### *Miletus fletus* sp. n.

♀. The fore-wing termen is slightly sinuate and the tornus is squarer than in *M. biggsii* (Dist.) ♀, from Malaya. Hind-wing very slightly prolonged at veins 3 and 4.

*Upperside*. Closely resembles *biggsii* ♀, but the fore-wing white discal band is slightly broader and its outer edge is rather more circular: vein 2 is dark dusted in the outer half of the discal band giving the impression of the white spot in space 1b being almost separated. This white area in space 1b is hardly half as long as that in space 2 (the corresponding white area in *biggsii* is as long as that in the space above). Cilia as in *biggsii* ♀.

*Underside*. Pale rusty brown (not greyish buff as in *biggsii*), with the fore-wing white area broader than above and its outer edge very evenly rounded. The fore-wing markings, arranged as in *biggsii*, are almost obsolete, except for the buff brown bar at the cell-end :

the ground colour is darker reddish-brown between the discal band and the termen on the fore-wing and in the tornal third of the hind-wing. The hind-wing markings as in *biggsii*, those in the basal half of the wing fainter, and the post-discal fascia broader and comprising broader contiguous spots, the irregular triangular spot in space 7 being isolated. An important distinction between this species and *biggsii* is that the underside markings are not outlined with whitish. *Cilia* rich rusty red on both wings. Underside of thorax and abdomen and colour of legs more rusty red than in *biggsii*.

Wing expanse 37.5 mm.

*Holotype*. MALAY PENINSULA : Pahang, Fraser's Hill, 3500 feet, 5.xi.1936 (J. N. Eliot). In British Museum.

♂. The fore-wing apex is more acute and the termen is straighter than in *biggsii* ♂ from Malaya. Vein 4 of the fore-wing is not thickened at its origin. The hind-wing is evenly rounded.

On both surfaces the colour, pattern and markings resemble those of the female, except that the colouring is paler, but it is suspected that this may be due to fading. Genitalia as shown in fig. 4.

Wing expanse 38 mm.

*Allotype*. MALAY PENINSULA : Pahang, Fraser's Hill, 4250 feet, 4.iii.1930 (A. S. Corbet). In my collection. This species is known to me only from the two specimens described. The left hind-wing of the male is damaged and, as Mr. J. N. Eliot had generously presented his specimen to the National Collection, it appeared preferable to make the female the holotype.

### *Miletus gaetulus* (Nic.).

*Gerydus gaetulus* de Nicéville, 1894, *J. Asiat. Soc. Bengal* 63 : 24, pl. v, f. 12 ♀; North-east Sumatra, Battak Mountains.

*G. gaetulus* Fruhstorfer, 1916, in Seitz, *Grossschmett. Erde* 9 : 820.

The species was recorded from Malaya by Evans (1933, *J.F.M.S. Mus.* 17 : 408), but I have seen no Malayan specimens. Subspecies from Kina Balu and Nias have been described as *innocens* (H. H. Drc.) and *aphylis* (Fruh.)<sup>1</sup> respectively; specimens from South-east Sumatra have a narrower hind-wing margin than in the nominotypical form.

### *Miletus archilochus kelantanus* (Cbt.).

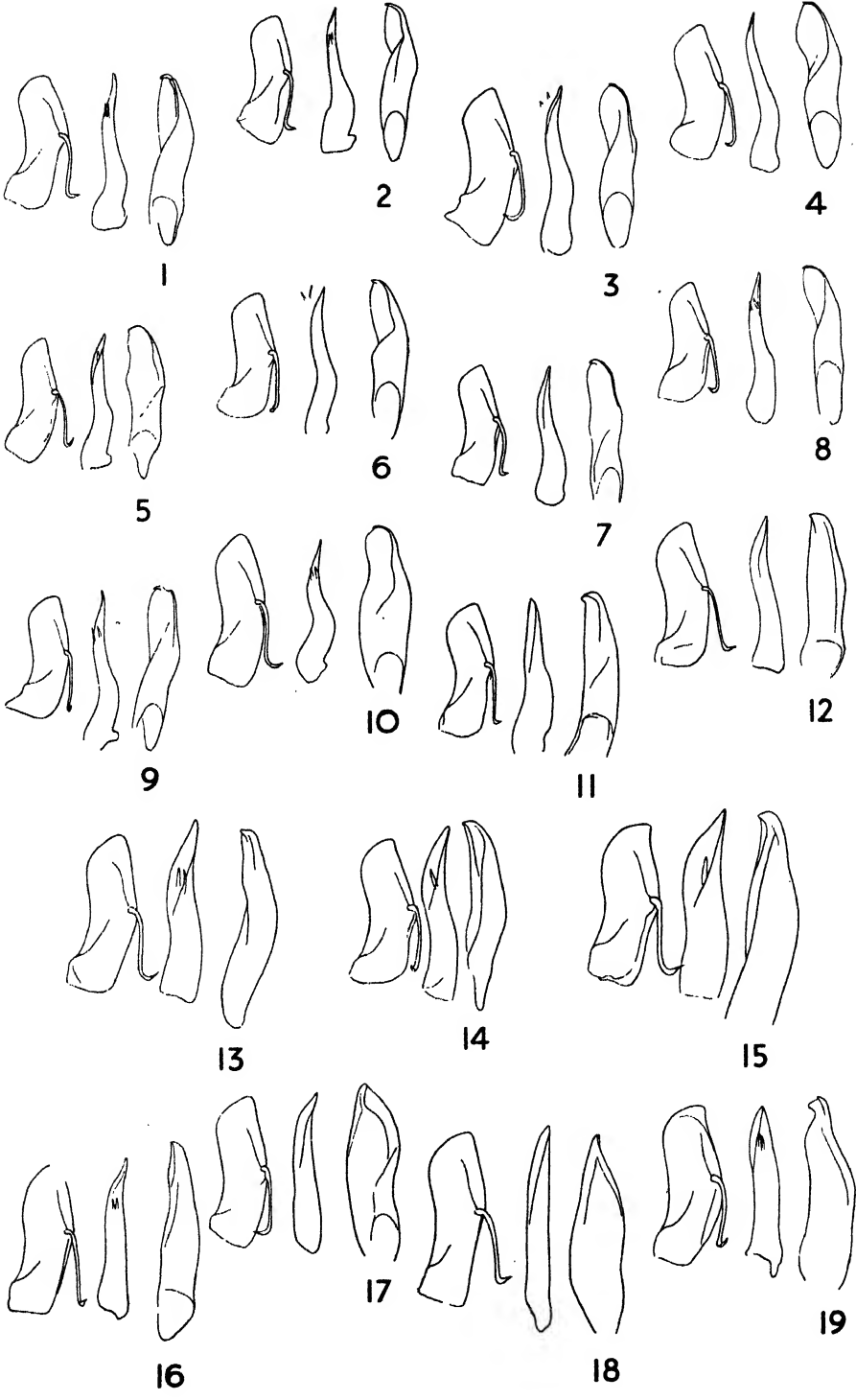
*Gerydus archilochus* Fruhstorfer, 1913, *Z. wiss. Insektenbiol.* 9 : 246; ♂♀, Tonkin. Figured in Seitz, pl. 141 b 4 ♂ und., 5 ♀.

*Miletus ar. kelantanus* Corbet, 1938, *J.F.M.S. Mus.* 18 : 248; ♂♀, Malay Peninsula, Kelantan.

This rare species is known only from a few specimens from Indo-China and North Malaya. A Selangor Museum male from Peninsular Siam (Trang, 30.iv.1924, *I. H. N. Evans*) is not separable from *kelantanus*.

Malayan *M. archilochus* and *M. gaesa* (Nic.) are very similar, but the former is larger and, on the underside, the fore-wing cell-end stripe is narrower and the outer bar in space 7 on the hind-wing is nearer the bar in space 6 than the middle bar in space 7 : in *M. gaesa* the outer bar in space 7 is midway between the other two.

<sup>1</sup> The female allotype of *aphylis* has the genital armature from a male attached to the abdomen.



*Miletus boisduvali xeragis* (Fruh.).

*Miletus boisduvali* Moore, 1857, in Horsfield and Moore, *Cat. Lep. Mus. E. I. Co.* 1: 19, pl. 1a f. 1 ♀; Java.  
*Gerydus boisduvali xeragis* Fruhstorfer, 1916, in Seitz, *Grossschmett. Erde* 9: 818; ♀, Singapore.

This variable species, which occurs from India and China to New Guinea, is remarkable for the almost total disappearance of the fore-wing white markings in some localities: some Bornean males of *M. boisduvali*, for example, hardly differ from *M. gaesa*, except in the small sex stripe on the fore-wing.

Other Malaysian races of *M. boisduvali* are *hyllus* (Fruh.) Sumatra, *vincula* (H. H. Drc.) North Borneo, *heraeon* (Fruh.) (= *carrinas* (Fruh.)) Sintang, West Borneo, *simalurensis* (Tox.) Simalur, and *oxyllus* (Fruh.) Bawean. The nominotypical form is figured in Seitz, pl. 141 e 3 ♀, and in Piepers and Snellen, pl. xix, f. 10a ♂, b ♀, and the Sikkimese race *milvius* (Fruh.) in Seitz, pl. 141 f 5 ♀.

The Burmese species *M. croton* (Doh.) and *M. longeana* (Nic.) approach *M. boisduvali*, but in both the outer edge of the fore-wing discal band is more arcuate. The male sex stripe is absent from *M. croton* (of which the Annamese race *mallus* (Fruh.) is figured in Seitz, pl. 141 f 1 ♂), but is present in *M. longeana*, in which the hind-wing discal area is broadly whitened and the fore-wing white discal band is often extended towards the wing base. I have failed to recognise *M. courvoisieri* (Fruh.), from Java, stated to differ from *M. boisduvali* in the more rounded wings and lighter underside.

*Miletus biggsii biggsii* (Dist.).

*Gerydus biggsii* Distant, 1884, *Rhop. Malay.*: 206, pl. xxii, f. 12 ♀; ♀♂, Malay Peninsula.  
*G. gopara* de Nicéville, 1890, *Butt. India, Burmah, Ceylon* 3: 25; ♂, Perak.  
*G. biggsii biggsii* f. *atomaria* Fruhstorfer, 1913, *Z. wiss. Insektenbiol.* 10: 307; ♂, Rhio Archipelago.  
*G. biggsii biggsii* f. *denticulata* Fruhstorfer, 1913, *Z. wiss. Insektenbiol.* 10: 307; ♂♀, North-east Sumatra.  
*G. biggsii biggsii* Fruhstorfer, 1916, in Seitz, *Grossschmett. Erde* 9: 819, pl. 141 g 1 ♂, 2 ♀.  
*G. biggsii biggsii* f. *atomaria* Fruhstorfer, 1916, in Seitz, *Grossschmett. Erde* 9: 819.  
*G. biggsii biggsii* f. *denticulata* Fruhstorfer, 1916, in Seitz, *Grossschmett. Erde* 9: 819.

This species, which extends from Burma, throughout Malaysia, to the Philippines, is subject to a high degree of individual and geographical variation. Some Malayan females are liable to be confused with that sex of *M. boisduvali xeragis* (Fruh.).

The form *denticulata* comprises specimens with dentated hind-wings, while in form *atomaria*, which has been taken in Singapore, the rather restricted white discal band on the fore-wing is dark dusted in a manner recalling *M. boisduvali*: unlike this species, however, the pale spots in spaces 1b and 2 on

FIGS. 1-19.—Male uncus plate, aedeagus and clasper of: (1) *Miletus croton shania* (Evans) (North Shan States); (2) *M. gaesa gaesa* (Nic.) (Sumatra); (3) *M. learchus learchus* Feld. & Feld. (Luzon); (4) *M. fictus* sp. n. (Malaya) allotype; (5) *M. archilochus kelantanus* (Cbt.) (Malaya) holotype; (6) *M. boisduvali assamensis* (Doh.) (Burma); (7) *M. boisduvali heraeon* (Fruh.) (holotype of *carrinas* (Fruh.)) (West Borneo); (8) *M. longeana* (Nic.) (Burma); (9) *M. biggsii biggsii* (Dist.) (Malaya); (10) *M. gaetulus* (Nic.) ssp. (South-east Sumatra); (11) *M. zinckenii valens* (Fruh.) (West Sumatra); (12) *M. symethus symethus* (Cram.) (Java); (13) *M. gigantes* (Nic.) (North-east Sumatra); (14) *M. ancon ancon* (Doh.) (Burma); (15) *M. ancon gigas* (H. H. Drc.) (Kina Balu); (16) *M. gallus* (Nic.) (Sumatra); (17) *M. heracleion* (Doh.) (Perak) holotype; (18) *M. leos teos* (Doh.) (South Flores); (19) *M. melanion vitellianus* (Fruh.) (Mindanao). All camera lucida drawings of the same magnification.



the fore-wing are not moved out of line with the rest of the discal band towards the termen.

An examination of the male genitalia of Malaysian *M. biggsii* has shown that the shape of the clasper is rather variable, but there are no grounds for supposing that such divergent forms as *biggsii* (Dist.), *atomaria* (Fruh.), or *cellarius* (Fruh.) are not conspecific.

Other Malaysian forms of *M. biggsii* are *nymphis* (Fruh.) West Sumatra; *cellarius* (Fruh.) Kina Balu, with remarkably broad fore-wing white bands and figured in Seitz, pl. 141 f 2 ♂, 3 ♀; *eustatius* (Fruh.) from the lowlands of North Borneo hardly differs from *cellarius*; *metrovius* (Fruh.) and *sebethus* (Fruh.) from Sandakan and South Borneo respectively are more like the nominotypical form; *natunensis* (Fruh.) Natuna Islands; *artaxatus* (Fruh.) West Java, with form *oichalia* (Fruh.) corresponding to f. *denticulata* and figured in Piepers and Snellen, pl. xix, f. 11 ♀; *extraneus* (Tox.) Pulau Weh; *niasicus* (Fruh.) Nias; *albotignula* (van Becke) Simalur and *batunensis* (Fruh.) from Pulau Tello in the Batu Islands, off the west coast of Sumatra.

#### *Miletus zinckenii pallaxopas* (Fruh.).

*Miletus zinckenii* Felder & Felder, 1865, *Reise Novara Rhopal.* : 284, pl. xxxv, f. 34 ♂ und.; ♂♀, Java.

*Gerydus zinckenii pallaxopas* Fruhstorfer, 1913, *Z. wiss. Insektenbiol.* 10 : 307; ♂♀, Selangor.

*G. zinckenii pallaxopas* Fruhstorfer, 1916, in Seitz, *Grossschmett. Erde* 9 : 820.

This species is confined to Malaysia, other subspecies being *valens* (Fruh.) Sumatra and *improbis* (H. H. Drc.) Kina Balu. The nominotypical form is figured in Seitz, pl. 141 e 2 ♀ and in Piepers and Snellen, pl. xix, f. 9a ♂, b ♀.

#### *Miletus symethus diopetithes* (Fruh.).

*Papilio symethus* Cramer, 1779, *Pap. Exot.* 2 : 84, pl. cxlix, f. B, C ♀; East Indies.

*Gerydus symethus* Distant, 1884, *Rhop. Malay.* : 205, pl. xx, f. 2 ♂, pl. xxii, f. 14 ♀.

*G. symethus diopetithes* Fruhstorfer, 1913, *Z. wiss. Insektenbiol.* 9 : 244; ♂, Rhio Archipelago, ♀, "ex museo Singapore."

*G. symethus diopetithes* Fruhstorfer, 1916, in Seitz, *Grossschmett. Erde* 9 : 821, pl. 141 d 6 ♂.

After *M. biggsii*, *M. symethus* is probably the commonest species of the genus in Malaya. A number of Malaysian subspecies and forms have been described : *acampsis* (Fruh.) North-east Sumatra, *petronius* (Dist.) Sandakan, *hieropöus* (Fruh.) Brunei, *bangkanus* (Fruh.) Banka, *vespasianus* (Fruh.) Nias (figured in Seitz, pl. 141 d 5 ♂), *batuensis* (Fruh.) Pulau Tello and *edonus* (Fruh.) Palawan. Both Fruhstorfer and Toxopeus regarded the nominotypical form as of West Javanese origin (Seitz, pl. 141 d 7 ♂, 8 ♀ and Piepers and Snellen, pl. xix, f. 8c ♂, a ♀), and *perlucidus* (Fruh.) (P. & S., f. 8b ♂) was described from East Java. The male holotype of the form *pandus* (Hsf.) is intermediate between Piepers and Snellen's figures 8d and 8e.

#### *Miletus gigantes* (Nic.).

*Gerydus gigantes* de Nicéville, 1894, *J. Asiat. Soc. Bengal* 63 : 23, pl. v, f. 1 ♂, 13 ♀; North-east Sumatra, Battak Mountains.

*G. gigantes* Fruhstorfer, 1916, in Seitz, *Grossschmett. Erde* 9 : 820, pl. 141 e 5 ♂.

In *M. gigantes*, the restricted white area on the fore-wing beneath is divided and does not extend from the cell to the inner margin as in *M. gaetulus*. The relationship between *M. gigantes* and *M. ancon* is very close, and it is only in the Malay Peninsula that both species occur.

*Miletus ancon ancon* (Doh.).

*Gerydus ancon* Doherty, 1889, *J. Asiat. Soc. Bengal* 58 : 438, pl. xxiii, f. 8 ♂; Tenasserim Valley, Tavoy District.  
*G. ancon ancon* Fruhstorfer, 1916, in Seitz, *Grossschmett. Erde* 9 : 820.

In *M. ancon* from Burma and Malaya, the fore-wing white discal band is completely divided in both sexes by a dark basal streak; in the Kina Balu representative *gigas* (H. H. Drc.) (Seitz, pl. 141 e 6 ♀), this white discal band is continuous in the male, although it is usually almost divided in the female. Although the male genitalia of *gigas* are larger and more robust than in nominotypical *ancon*, these differences are of degree rather than of kind. Fruhstorfer gave the name *anconides* to the Sarawak form of *M. ancon* described by Moulton (1912, *J. Straits Branch roy. Asiat. Soc.* 6 : 77) as being intermediate between *ancon* and *gigas*.

*Miletus gallus* (Nic.).

*Gerydus gallus* de Nicéville, 1894, *J. Asiat. Soc. Bengal* 63 : 25, pl. v, f. 11 ♀; North-east Sumatra, Battak Mountains.  
*G. gallus* Fruhstorfer, 1916, in Seitz, *Grossschmett. Erde* 9 : 820, pl. 141 e 1 und.

Although this species differs from *M. heracleion* principally in the more extensive white area on the underside of the fore-wing, the differences in the male genitalia are considerable.

*Miletus heracleion* (Doh.).

*Gerydus heracleion* Doherty, 1891, *J. Asiat. Soc. Bengal* 60 : 36; ♂, Malay Peninsula, Perak.  
*G. heracleion* Fruhstorfer, 1916, in Seitz, *Grossschmett. Erde* 9 : 820.

This species is known to me only from the unique male holotype and a single specimen of the undescribed female.

♀. The wing shape differs from that of the male only in that veins 3 and 4 are slightly prolonged on the hind-wing.

Upperside and underside as in the male, except that, on the rather paler underside, the white area in spaces 1b and 2 is more elongated.

Wing expanse 37 mm.

*Neallotype*. MALAY PENINSULA : Perak (*W. Doherty*). In British Museum, ex Coll. Oberthür.

The British Museum (Natural History) has the types of *boisduvali* Mre., *croton* Doh., *pandu* Hsf., *shania* Evans and *vincula* H. H. Drc., and all the *Miletus* forms described by Fruhstorfer which are mentioned in this paper except *anconides*, *courvoisieri*, *hieropöus* and *natunensis*, and I am indebted to the Trustees of the Museum for permission to study their collections.

## BOOK NOTICE.

*Danmarks Fauna. Biller [Coleoptera] X. Malacodermata, Fossipedes, Macro-dactylia og Brachymera.* [By] V. HANSEN. Larverne ved S. G. LARSSON. København (G. E. C. Gads Forlag). pp. 320, 96 + 101 figs. Price 9.00 Kronor. 1938.

This handy-sized book forms one of the well-known *Danmarks Fauna* series and is the 10th volume devoted to the beetles.

It is divided in two parts; the first (pages 1-192) is concerned with imagoes and is written by V. Hansen, and the second (pages 193-320) with larvae and is written by S. G. Larsson. In each part there is a series of keys of families, genera and species, and each species is dealt with separately; all available information is given. A very high percentage of species is illustrated by original figures.

The treatment of the second part follows the pattern of the first.

## BOOK NOTICE.

*Index V to the literature of American Economic Entomology. January 1, 1930 to December 31, 1934.* Compiled by Mabel COLCORD. Edited by E. P. FELT. College Park, Md. (American Association of Economic Entomologists). Special Publication No. 5. pp. [x] + 693. (Printed in double column.)

This volume is a continuation of Indexes I-IV, a series which continues the earlier bibliographies of Henshaw and Banks, and the whole represents a unique index to national literature on Economic Entomology.

The production of literature on this subject in America is so great that a complete index to it is necessarily of value to readers other than those interested solely in American Economic Entomology.

In form the book is one alphabetical index arranged by subjects. The list of subject headings is exhaustive and many cross references are given. A series of symbols denotes newly described insects, whether an article or book is illustrated, or that some presumably less important references have been deleted by the editor. This last has been done in an attempt to keep the publication within the bounds of usefulness. It does not appear that the completeness of the book has suffered as a result.

ON THE OCCURRENCE OF TWO SPECIES OF *SISYPHUS* IN MAURITIUS, WITH DESCRIPTION OF A NEW SPECIES AND THE DESCRIPTION OF A NEW *ADORETUS* FROM RÉUNION (COL. SCARABAEIDAE)

By J. VINSON, F.R.E.S.

(Department of Agriculture, Reduit, Mauritius.)

*Sisypheus regnardi* Alluaud, 1898, was hitherto the only species of this genus known to occur in Mauritius. The fact that a second endemic species, obviously related to it, also exists in the island appears remarkable, chiefly when considering the particular inland distribution of the two species. An important feature is that one of the species has undergone a considerable reduction of the hind-wings and is flightless.

The *Sisypheus* of Mauritius are typically highland-inhabiting forms restricted to the moist forests. They seem to be very sensitive to certain ecological factors such as high humidity, low temperature and probably also nature of the soil, conditions which are only found in the uplands of the island or on the slopes of certain mountains. These localities are often enveloped in clouds and mists and are subjected to a high rainfall (125–175 in. per annum) while the relative humidity varies from 80 to 90%. It has been noticed that these insects never live at altitudes less than 1700 ft. nor on mountains which for some reason are relatively dry (for instance the Corps-de-Garde, 2358 ft.)

*Sisypheus regnardi* only lives on the Pouce mountain (2661 ft.) in the north-west of Mauritius, where it is found from 1700 to 2400 ft. and over an area of about one-quarter square mile or 160 acres.

*Sisypheus vicinus* sp. n. has a wider range. It has been observed on the inner slope of the extinct crater known as the "Trou-aux-Cerfs" (2000 ft.), near the "Maccabé" forest (1800–2000 ft.) and at about 1800 ft in the neighbourhood of the "Bassin Blanc," another extinct crater. These three localities, four to ten miles apart, are all situated on the same higher plateau delimited by the 1800 ft. contour line in the south-western part of the island. It is in this upland block, of an area of about 38 square miles or approximately 24,300 acres, that the largest patches of indigenous thicket still exist.

The Pouce mountain is eight miles distant from this south-western plateau, from which it is separated by a lower plateau the maximum elevation of which is 1400 ft. This lower plateau, which was originally under moist forest, was gradually cleared with the colonisation of Mauritius, so that in the year 1872 the mountain range including the Pouce had been completely isolated by cultivated lands from all the parts of the island still under indigenous vegetation. It is needless to add that such an isolation is far too recent to be reckoned here as an evolutionary factor. But it is quite obvious that the two species concerned are living in two stations which must be considered as being "closed," in spite of the relatively short distance between them. It would appear, therefore, that altitude, or rather its meteorological consequences, are the mechanism of isolation of the two populations. This isolation is rendered more complete by the fact that *Sisypheus regnardi* is flightless, its hind-wings being vestigial. Consequently individuals of its population being never on the wing are not liable to be swept easily by wind to meet the *S. vicinus* population and to interbreed with it. On the other hand, *S. vicinus* has the power of flight, its hind-wings being fully developed, but even if eventually

swept by wind its chances of meeting the *S. regnardi* population appear exceedingly small since this species occupies only a very limited area on a mountain cone. If in the past a few intermittent exchanges have taken place between the two populations, with interbreeding, the entity of the two species has not been affected, possibly owing to selection pressure upon the highly complex genetic mechanisms.

As regards the cause of reduction of the hind-wings in one of the species, the problem appears to be even more obscure. According to some recent writers on the subject, such as Miss D. J. Jackson,<sup>1</sup> flightlessness in beetles is of mutational origin and is not the direct effect of environment: restricted environment may have only favoured the preservation of species already apterous or with vestigial wings. This explanation, however, does not appear very satisfactory for the particular case under consideration, since of two evidently allied species the one restricted to an exposed mountain cone is flightless whereas the other distributed over a much wider plateau is fully winged. It would seem that the older idea fits more aptly: namely, that the reduction of the wings may be caused by the direct influence of environment, flightlessness being considered a positively advantageous condition in the preservation of species living on exposed mountains or in restricted areas (flying insects being much more liable to be blown away to the sea or to unsuitable areas).

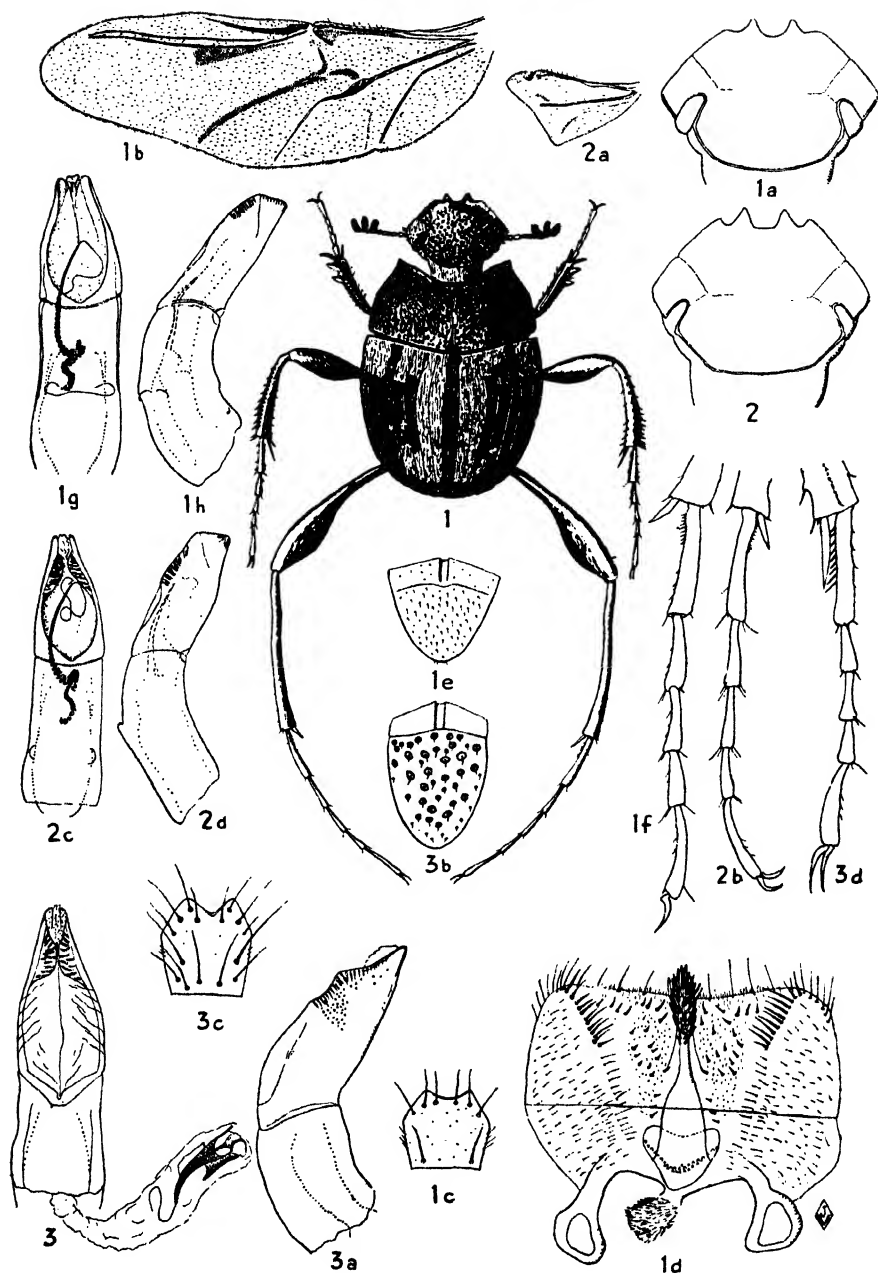
Little is known about the biology of the two Mauritian *Sisypus*. The adults have been observed feeding on animal excreta and it is probable that the eggs develop in small pellets of dung, as in the other members of the genus. It is chiefly on monkeys' excreta that the beetles are seen but they will probably feed also on birds' excreta. I have kept a few adults on fowl excreta for several weeks but could not obtain oviposition. On the Pouce I have even seen a few *Sisypus* attracted by a decomposing mollusc. In the same place I have captured several examples under stones where they were probably sheltering.

It may be useful to note that the monkey occurring in Mauritius is *Macacus cynomolgus* (Linn.), an Indian species which is believed to have been introduced in Mauritius by the Portuguese in 1528.

In connection with the description of the following new species, I wish to express my thanks to Dr. R. Paulian, who has been kind enough to compare the material communicated to him with the type of *Sisypus regnardi* Alluaud in the Muséum d'Histoire naturelle, Paris. He has also sent me a series of the Indian *S. longipes* Ol., the nearest ally to the Mauritian species. With reference to the *Adoretus* species, Dr. Paulian has favoured me with many useful bibliographical notes on the species hitherto known from Réunion and on the material from that island in the Paris Museum.

[It should be made clear that no species of *Sisypus* is known from the other Mascarene Islands, Réunion and Rodriguez, nor from Madagascar, nor the Comoros, nor the Seychelles. In the copy of Gillet's Catalogue of COBRINAE (1911, *Coleopt. Cat.*, 38: 22-25) at the British Museum (Natural History), a copy with manuscript additions to date by Mr. G. J. Arrow, 44 species are listed, *S. vicinus*, in this paper, making the forty-fifth. One is european and mediterranean, one is central-american, eleven are asiatic (mainly tropical), thirty are recorded from various parts of tropical and south Africa, and the remaining two are the Mauritian species discussed in this paper.—H. SCOTT.]

<sup>1</sup> 1928, *Trans. Roy. Soc. Edinb.* 55: 665-735, pls. I-VII; see also comments by Dr. Hugh Scott, 1933, *Trans. linn. Soc. Lond. (Zool.)* 19: 344.



FIGS. 1-3.—1. *Sisyphus vicinus* sp. n.; 1a, head; 1b, hind-wing; 1c, mentum; 1d, epipharynx; 1e, pygidium; 1f, hind tarsus; 1g, aedeagus, dorsal view; 1h, aedeagus, side view;—2. *S. regnardi* Alluaud, head; 2a, hind-wing; 2b, hind tarsus; 2c, aedeagus, dorsal view; 2d, aedeagus, side view;—3. *S. longipes* Ol., aedeagus, dorsal view; 3a, aedeagus, side view; 3b, pygidium; 3c, mentum; 3d, hind tarsus. (Figs. 1, 1b, 2a, are drawn to scale.)

## Coprini.

*Sisypus vicinus* sp. n.

♂♀. Length: 3.4-4.4 mm.; max. width: 2.0-2.7 mm.

Brownish-black, rather shiny, with a violaceous bronzy lustre on head and pronotum, elytra more or less variegated with yellow; convex. Head, pronotum and elytra glabrous with the exception of a few hairs on the frons and some extremely short rudimentary hairs on the elytral interstices only just visible under a certain light at  $\times 30$ . Head strongly and rather closely punctured, punctation limited at back just before neck by a fine border starting from the eyes; clypeus bidentate, the bottom of the incision between the teeth rounded; mentum slightly emarginate at tip, with surface bearing a few short setae (eight). Pronotum strongly punctured, punctation rather strigate and oblique, median part more or less narrowly impunctate half-way from base, this impunctate area with a fine stria deeply impressed at base; base, apex and sides finely bordered, sides impunctate laterally. Elytra rounded behind, variegated with more or less obscure yellow, coloration arranged as follows: 1st interstice brownish-black, 2nd and 3rd completely yellow, 4th and 5th yellow at base and at apex, 6th completely brownish-black, 7th yellow at base, all remainder of elytron brownish-black; 7th interstice very large at base, on account of the deviation of the 6th stria, where it is rather convex as a callus. Striae punctate; interstices minutely punctured, punctation more or less arranged in rows on each side of the striae, i.e., two rows in each interstice. Microsculpture well visible on elytra at  $\times 30$ , in isodiametric meshes; head and pronotum not microsculptured above. Underside with mesosternum not very densely punctured, metasternum densely punctured with oval punctures; meso-metasternal suture very slightly angled at middle towards mesosternum. Pygidium punctured and pubescent, the part of the base covered by the elytra with a median longitudinal groove. Front tibiae tridentate externally and finely crenulate. Posterior legs very long, about twice length of body, their tarsal segments relatively long, chiefly III and IV which together are longer than I, proportions as follows: 100, 67, 57, 50, 83; tibial spur rather short, about one-third length of basitarsus; hind tibiae somewhat twisted near middle, gradually broadened from that point and slightly arcuate to the tip, their surface smooth externally, not bearing denticulate carinae and only very slightly pubescent. Middle and hind coxae microsculptured but rather superficially. Hind-wings fully developed. Secondary sexual characters not very apparent, hind femora in male being only very slightly more swollen than in female. Male aedeagus as figured, containing a sclerotised whip-like thread probably homologous to the "Spiral-Faden" described by Dr. Walther Horn from the aedeagus of certain CICINDELIDAE (1932, *Livre Centenaire Soc. ent. Fr.*: 197-198).

MAURITIUS: Trou-aux-Cerfs (2000 ft.), 9.xii.1933 (*Ray, Mamet & J. Vinson*); Maccabé forest (1800 ft.), 20.xii.1937 and 13.i.1938 (*J. Vinson*). Several examples.

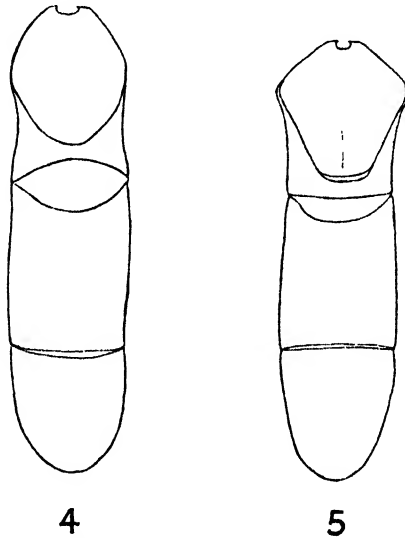
Type, from Maccabé forest, in British Museum; paratypes in Muséum National d'Histoire naturelle, Paris, and in my collection. Material studied: 20 examples.

Closely related to *Sisypus regnardi* Alluaud (1898, *Bull. Soc. zool. Fr.* 23: 64), also from Mauritius. *Sisypus regnardi* is, however, very distinct by the following characters:—

The head, pronotum and elytra are strongly pubescent, the clypeus is rather quadridentate and the bottom of the incision between the median teeth is not rounded as in *vicinus* but is straight. In *regnardi* the hind-wings are vestigial, the elytra are unicolorous and the relative proportions of the tarsal segments in the hind legs are somewhat different, being: 100, 60, 53, 47, 77. The aedeagus of the two species look rather similar, the

difference being that in *regnardi* the parameres are developed into two slight flaps on the upperside whereas in *vicinus* there appear to be no flaps. It is possible that in the genus *Sisyphus* this organ is built on a uniform type, with slight specific variation which is mostly internal. Even in an exotic species such as *S. longipes* Ol., of southern India, the aedeagus, although obviously distinct, does not differ considerably from those of the two Mauritian species. Amongst the differences it will be seen that in *longipes* the basal piece is proportionately shorter; in the two males I have dissected, the internal sac was in both cases found protruding outside the basal piece, bearing with it the "Spiral-Faden." In *vicinus* and *regnardi* the internal sac was always found inside the aedeagus with the "Spiral-Faden" fixed in a definite position, as figured.

*Sisyphus longipes* Ol. is the described species nearest to the two Mauritian forms, from which it differs by its larger size (4.5–5.5 mm.), cordiform elytra, convex and only superficially punctate pronotum, ocellate punctation of all the body, shorter hind legs with the tibiae carinate and more arcuate, relative lengths of their tarsal segments (100, 43, 43, 37, 77), and many other characters. The hind-wings of *S. longipes* are fully developed and its head, pronotum and elytra are pubescent.



FIGS. 4-5.—4. *Adoretus borbonicus* sp. n., aedeagus; 5. *A. femoratus* Lap.-Cust., aedeagus.

#### Rutelini.

##### *Adoretus borbonicus* sp. n.

♂. Length: 13 mm.; max. width: 6.5 mm.

Oval, rather widened posteriorly, slightly convex; reddish-brown, shiny, surface not very closely punctate, with short scale-like yellowish hairs, rather procumbent. Head punctate throughout; between the coarse punctures which bear the hairs a much finer punctation is present, visible at  $\times 30$ ; clypeal suture well marked. Eyes not very prominent. Maxillary palpi with last segment not swollen and much longer than penultimate. Pronotum punctate as head, with minute punctures intermingled with the coarse ones, the latter bearing the hairs. Posterior angles obtuse, rather sharp. Elytra with the usual striae carinae very feebly indicated, except near base where they are more



visible. Punctuation umbilicate; the pubescence is not borne by the punctures as on head and pronotum but is placed close to them; punctures confluent in some places. *Under-side* yellowish-brown, sparsely pubescent. *Antennae* and *legs* testaceous with the tarsi darkened, especially the hind ones, hind tibiae reddish-brown; larger claw of the front and median tarsi distinctly cleft. Aedeagus as figured.

RÉUNION (Bourbon): Plaine des Cafres (5200 ft.), 10.xii.1937 (*Miss J. Pitot*). Holotype, in my collection.

Closely allied to *A. femoratus* Lap.-Cast., of Mauritius. More rufous, more shiny, elytral carinae less visible, eyes smaller, hind tibiae and tarsi lighter in colour, aedeagus much less widened at distal part.

#### BOOK NOTICE.

*Die Zooecidien durch Tiere erzeugte Pflanzengallen Deutschlands und ihre Bewohner.* Von E. H. RÜBSAAMEN † und H. HEDICKE. Siebente Lieferung pp. 265–296, pls. 24–29, figs. 68–77, 1938. Achte Lieferung pp. 297–328, pls. 30–35, figs. 78–102, 1938. Neunte Lieferung pp. 329–350, pls. 36–42, 1939. 4to, Stuttgart (E. Schweizerbart'sche Verlagsbuchhandlung) Zoologica, Stuttgart, Heft 77.

Rübsaamen's work on the Gall flies of Germany was unfortunately not completely published at the time of his death, but a successor able and willing to continue the work was found in Dr. H. Hedicke.

The second volume (Cecidomyiden und ihre Cecidien) commenced publication in 1926 and is now (1939) completed. There was a break during the years 1926 to 1938. Volume 2 comprises Lieferungen 5–9 of the whole and has 42 coloured plates. Lieferungen 7–9 continue the keys to species started in earlier parts, but owing to financial considerations it is stated that with the abbreviated conclusion of the CECIDOMYIDAE the publication of the work will be concluded.

The coloured plates depict the gall fly and the gall it causes on the plants it affects. A title-page to Volume 2, an index to genera and explanations to the plates completes Lieferung 9.

The whole is issued as Heft 77 of Zoologica, Stuttgart.

# ON FIVE GENERA IN THE LEPIDOPTERA RHOPALOCERA AT PRESENT WITHOUT VALID NAMES

By Francis HEMMING, C.M.G., C.B.E., F.R.E.S.

THE following notes have been made in the course of recent revisional work on the generic names of the Rhopalocera :—

## NYMPHALIDAE.

### *Lelecella* gen. n.

*Generic characters.*—I select as the generic characters of *Lelecella* Hemming the characters given by de Nicéville for *Lex* de Nicéville, 1900 (*J. Asiat. Soc. Beng. Pt. 2*, 78 : 234).

Type : *Lelecella limenitoïdes* (Oberthür, 1890) (= *Vanessa limenitoïdes* Oberthür, 1890).

The name *Lelecella* Hemming is proposed, because *Lex* de Nicéville is invalid, being a homonym of *Lex* Rafinesque, 1815 (*Analyse* : 108).

## HESPERIIDAE.

### *Cyrina* gen. n.

*Generic characters.*—I select as the generic characters of *Cyrina* Hemming the characters given by de Nicéville for *Creteus* de Nicéville, 1895 (*J. Bombay nat. Hist. Soc.* 9 : 385).

Type : *Cyrina cyrina* (Hewitson, 1876) (= *Hesperia cyrina* Hewitson, 1876).

The name *Cyrina* Hemming is proposed, because *Creteus* de Nicéville is invalid, being a homonym of *Creteus* Westwood, 1852 (*in* Doubleday, *Gen. diurn. Lep.* (2) : 511).

### *Meza* gen. n.

*Generic characters.*—I select as the generic characters of *Meza* Hemming the characters given by Holland for *Gastrochaeta* Holland, 1894, when he dealt with this genus in 1896 (*Proc. zool. Soc. Lond.* 1896 (1) : 37).

Type : *Meza meza* (Hewitson, 1877) (= *Hesperia meza* Hewitson, 1877).

The name *Meza* Hemming is proposed, because *Gastrochaeta* Holland is invalid, being a homonym of *Gastrochaeta* Dujardin, 1841 (*Roret's Suite à Buffon, Infusoires* : 384).

### *Naevolus* gen. n.

*Generic characters.*—I select as the generic characters of *Naevolus* Hemming the characters given by Godman for *Cydrus* Godman, 1900 (*in* Godman & Salvin, *Biol. cent.-amer. Lep.-Rhop.* 2 : 512).

Type : *Naevolus naevolus* (Godman, 1900) (= *Cydrus naevolus* Godman, 1900).

The name *Naevolus* Hemming is proposed, because *Cydrus* Godman is invalid, being a homonym of *Cydrus* Billberg, 1820 (*Enum. Ins.* : 81).

### *Remella* gen. n.

*Generic characters.*—I select as the generic characters of *Remella* Hemming the characters given by Godman for *Perimeles* Godman, 1900 (*in* Godman & Salvin, *Biol. cent.-amer. Lep.-Rhop.* 2 : 542).

Type : *Remella remus* (Fabricius, 1798) (= *Hesperia remus* Fabricius, 1798).

The name *Remella* Hemming is proposed, because *Perimeles* Godman is invalid, being a homonym of *Perimeles* Lenz, 1831 (*Naturg. Säugth.* : 158), an emendation of *Perameles* Geoffroy, 1803 (*Bull. sci. Soc. Philom., Paris* 80 : 150).

A NEW BLATTID FROM TANGANYIKA (*CALOLAMPRA*  
*ARBORIFERA* SP. N.) (ORTHOPTERA, BLATTIDAE)

By Dr. R. HANITSCH.

(Communicated, with a note on its copulation, by E. BURTT, F.R.E.S.)

*Calolampira arborifera* sp. n.

♂. Head exposed; occiput fuscous, vertex and face cream-white, a large shining black blotch extending from eye to eye and ventrally to the middle of the face where it partly forks; palps short, proximal segments fuscous, the two terminal ones deep castaneous; antennae with base testaceous, remainder fuscous. Pronotum nearly one and a half times as broad as long, front margin rounded, hind margin produced; with faint transverse striations near either margin; disk with symmetrical black markings, viz. a pair of longitudinal black streaks, in front branching off to either side, and three pairs of smaller black marks grouped at either side of the posterior end of the longitudinal streaks; the whole of the pronotum, except in the extreme lateral regions, with closely packed shallow black punctures; posterior border with a series of indistinct black spots. Tegmina exceeding the abdomen by twice the length of the cerci; mediastinal area pale testaceous, bordered on the outside by a narrow black line, fading away distally, on the inside by a shorter, but much broader black streak; rest of the tegmina dark testaceous, with numerous fuscous blotches in their proximal half, fewer distally; mediastinal vein with three indistinct branches; radial vein in its proximal course with five simple costals, just beyond the middle breaking up into seven branches; ulnar vein seven-ramose, cross-venules strongly marked; anal sulcus extending to three-fifths of the posterior margin, nine anals, the central ones regular, the lateral ones in part irregularly ramose. Wings fuscous, with central portion of costal area light testaceous; mediastinal vein very long, reaching nearly to the apex of the wing, with about five indistinct branches; radial vein dividing at three-fifths from the base, its four branches going to the apex of the wing; median vein simple; ulnar vein with four complete and five incomplete branches; no apical triangle. Abdomen above fuscous. Supra-anal plate semi-circular, faintly emarginate, base with a large piceous blotch, remainder testaceous. Cerci pale testaceous. Abdomen below very pale testaceous. Sub-genital plate two-thirds as long as broad, asymmetrical, with a slight emargination on the right; styles very short, conical, pale testaceous, situated on either side at the base of the sub-genital plate. Legs very pale testaceous, with spines reddish-brown; front femora with three spines near centre of lower margin; mid and hind femora with two spines each, and each femur with a genicular spine (broken off on left front femur and left mid femur?); tibiae strongly armed with three rows of spines; posterior basitarsus in length one and a half times that of the remaining segments combined, entirely spined; first segment armed, remainder unarmed; tarsal claws symmetrical, arolia present.

♂. Total length 19 mm.; pronotum 4.1 × 5.8 mm.; body 17 mm.; tegmina 15.5 mm.

♀. Apterous. Sub-elliptical in outline, greatest width between third and fourth abdominal segments. Head freely exposed; vertex and face testaceous, the latter with a large castaneous blotch extending from eye to eye, and continued downwards nearly to the clypeus; maxillary palps castaneous; antennae with base dull testaceous, remainder fuscous. Pronotum with anterior margin parabolic, posterior margin faintly rounded; reddish testaceous, disk finely mottled with fuscous, with a lighter median streak and a

darker blotch on either side at the front of the disk; a row of about 18 black spots along the hind margin. Mesonotum, metanotum and tergites dark rufo-testaceous, finely mottled with fuscous, each with a row of black spots along the posterior margin. Supra-anal plate twice as broad as long, posterior margin faintly emarginate. Cerci nearly as long as the supra-anal plate, pale orange. Abdomen below shining dark castaneous, centre somewhat lighter. Legs testaceous; front femora along the inferior margin with three spines each, mid and hind femora with two each; front femora in addition with one genicular spine each, mid and hind femora with two each; tibiae strongly armed, spines reddish testaceous, in three rows; posterior basitarsus one and a half times as long as the remaining segments combined, entirely spined; first tarsal segment spined, remaining segments unarmed; claws symmetrical, arolia present.

♀. Total length 17 mm.; pronotum : length 5 mm., greatest width 9 mm.

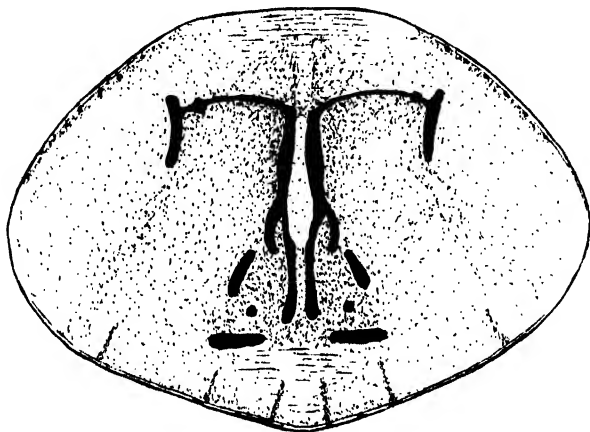


FIG. 1.—*C. arborifera* sp. n. pronotum.

Holotype ♂; allotype ♀; taken *in copula*; Shinyanga, Tanganyika, 31.xii.1936 (*E. Burtt*).

Presented by the captor to the University Museum, Oxford.

In 1930, *Ann. Mus. civ. Stor. Nat. Genova* 55 : 19–21, notwithstanding some slight differences, I recorded and redescribed a Blattid ♂, from Akek, near the Webi Shebeli, under the name *Calolampra* (*Epilampra*) *pardalina* (Walker), which Dr. Uvarov had very kindly compared with the type from Lake N'Gami, Central Africa. Rehn, in 1922, *Ann. Transvaal Mus.* 9 : 35, recorded the same species from two localities in the Transvaal, regarding at the same time as synonymous *Calolampra aptera* Schulthess-Schindler (Somaliland and Kilimanjaro), the description of which had been based upon the female only.

Dr. Uvarov has placed me under further obligation by having compared also the present material from Tanganyika with the type of *C. pardalina* (Wlk.). He informs me that the type differs from it by having "the pronotum relatively much broader, lighter in colour, without a dark sub-marginal line; elytra much lighter in colour, without the black sub-costal line; wings hyaline; supra-anal plate emarginate; anterior tibiae shorter, distinctly inflated." I therefore think myself justified in regarding the present species as hitherto undescribed.

## NOTE BY E. BURTT.

As I stepped out of my house at Shinyanga, about dusk on 31 December 1936, I was interested to note some small dark object careering about very rapidly on the gravel. The light was uncertain and the object moved so fast that at a casual glance I took it to be a small Solpugid searching for its prey. On closer inspection the object resolved itself into a pair of cockroaches *in copula*. The pair was being followed most assiduously by two other males which kept making rapid darts at them in an effort to oust the successful male, and it was in attempting to escape their attentions that the pair were darting rapidly about hither and thither and had thus attracted my notice.

## BOOK NOTICE.

*Festschrift zum 60 Geburtstag von Prof. Dr. Embrik Strand*. Vol. IV. 8vo. Riga, 1938. pp. 784, 16 pls., 203 figs.

This volume contains 27 articles of which 13 are entomological in interest and many more are concerned with Spiders or Arachnids.

The papers are of varying length, that by Dr. Breuning on new Cerambycids extends to well over 100 pages.

The publication of a fifth, and last, volume is announced. It will include a complete index to the 5 volumes of the "Festschrift."

## BOOK NOTICE.

*Catalogus Lepidopterorum regionis palaearticae*. Verlag O. Staudinger and A. Bang-Haas. Lieferung 7 (pp. 97-112) 1938; Lieferung 8 (pp. 113-128) 1939.

The general description of this work has already been given in this magazine. The 2 parts here to be noticed are concerned with the Heterocera and comprise the AGARISTIDAE and AGROTIDAE. The latter family is listed to genus *Apamea*. As in earlier parts prices are quoted for such species, or subspecies, as are available from Messrs. Staudinger and Bang-Haas.

## BOOK NOTICE.

*The insects of North Carolina*. By C. S. BRIMLEY. 8vo. Raleigh, N.C. (North Carolina Department of Agriculture, Division of Entomology). 1938. pp. 560.

This work is an annotated list of all insects, arachnids, myriapods and land and fresh-water Crustacea recorded for North Carolina. It lists a grand total of 10,204, of which 9566 are true insects. It is estimated that this total is rather less than one-half the species represented in the State.

The list is systematically arranged under genera, and gives for each species the distribution as at present known, the times of appearance and the situations where the species has been found. In some cases an estimate of the abundance of the species is given.

## A NEW SPECIES OF PHORIDAE (DIPTERA) ASSOCIATED WITH MILLIPEDES, FROM THE YEMEN

By the Rev. Fr. H. SCHMITZ, S.J.

(*Ignatiuskolleg, Valkenburg (Lbg.), Holland.*)

Communicated by Hugh SCOTT, Sc.D., F.R.E.S.

[INTRODUCTORY NOTE.—The species described below was discovered during the recent British Museum (Natural History) Expedition to South-Western Arabia.

The Phorid flies were first noticed by Mr. E. B. Britton. They were riding on a large black millipede which was crawling slowly on a path close to the ancient city of Ta'izz in southern Yemen, at an altitude of 4500 feet, on 23rd December, 1937. The time was between 4 and 5 p.m. and the path was in shadow. The millipede (not preserved) was not, apparently, dirty or covered with any substance attractive to the flies. I remained until I had collected six of the flies, which, when disturbed, flew off the millipede but persistently returned. The case is evidently one either of phoresy or of parasitism, and Father Schmitz has given below his reasons for believing the Phorid to be, in its early stages, an endoparasite of the millipede.—HUGH SCOTT].

### **Megaselia (Aphiochaeta) equitans** sp. n.

A medium-sized species; with one long mesopleural bristle; nearly related to *M. (A.) elongata* (Wood) (Europe), but of yellowish-red colour and with four scutellar bristles in both sexes.

♂. *Head*: frons broader than high (4:3, but varying somewhat), reddish, often extensively stained with brown, dull or very slightly shining, with short pubescence and strong black bristles. The middle row of bristles nearer the upper than the lower row. Supra-antennal bristles small and unequal: the lower pair are only minute hairs, very close to the upper and not, or only slightly, nearer together, sometimes entirely wanting. Upper supra-antennals approximate, of half the size of the other frontal bristles. Antial bristles in about the middle between the middle line and the inner eye-margin, subparallel, directed backwards. Anterolateral bristles a little higher than the upper supra-antennals. Middle row of bristles not equidistant, the precellar pair being more approximate. Third antennal segment of normal size, reddish with the apex darker. Arista of ordinary length, with very short pubescence. Palpi not long, about one and one-half longer than broad, yellow, with 5 or 6 short but stout bristles on the outer half. Cheeks with two hair-like bristles. *Thorax* reddish, with yellowish-brown pubescence. Scutellum with four bristles of equal length. Pleura yellow, mesopleura hairy, with one very long bristle (longer than the frontal bristles). *Abdomen* somewhat long, broadest at second segment (which is a little elongate), tapering behind, yellowish-red, generally with third and fourth segments black, but less dark (to reddish) along the middle; hind margin of first segment and posterior half of second brownish to blackish. Fifth and sixth segments reddish, sometimes more or less infuscated. Venter yellow. The abdomen is sparingly haired, the hairs along the hind margins of the segments are not longer than the others, except on the sixth segment and at the sides, as usual. At the sides of the second segment there are 2-3 rather longer hairs. Hypopygium of normal size, nearly as long as high, brown or blackish, dull, sparingly haired, without bristles. Ventral plate large, reaching far behind, nearly to the end of the upper part. Anal tube large, as long as the hypopygium itself and fairly high, with well-developed terminal hairs, yellow. *Legs* entirely yellow. Front tarsi rather slender. Hind femora broadened as usual, not darkened at the end, ventrally on the anterior half with 4-5 long hairs. Hind tibial bristles distinct, not numerous; from the beginning of the second quarter

there are 7-9 visible. *Wings* (see figure) distinctly yellowish. Costa not reaching the middle of the wing (0.46), costal divisions about  $16:9\frac{1}{2}:4$ ; costal cilia short. Fork not large, with the angle rather acute. Fourth vein issuing behind the base of the fork, evenly curved. *Halteres* yellowish-red, not rarely strongly infuscated. Length 1.7-1.9 mm.

♀. Similar to the ♂, but a little darker; frons brownish, abdominal tergites brown. Frons perhaps less broad, third antenna segment small, palpi scarcely as long as in the ♂ and with the bristles a little longer, proboscis ordinary. Sixth abdominal segment elongated as in *M. (A.) elongata* (Wood) ♀; as in that species, it has longish bristly hairs all round the hind margin. Of the ovipositor, which is without doubt constructed mainly as in *M. (A.) elongata*, only the extreme tip is visible and this is quite of the same shape as in *M. (A.) elongata*, compressed laterally. Hind femora less broad than in the ♂, first costal division scarcely longer than the other two together. Length 1.75 mm.

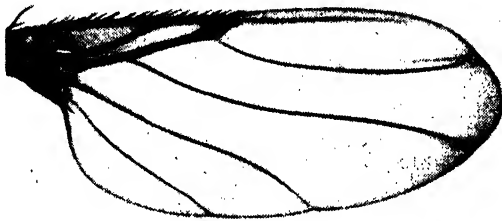


FIG. 1.—*Megaselia equitans*, wing.

Described from 5 ♂♂ (holotype and four paratypes), 1 ♀ (allotype), collected in YEMEN: Ta'izz, c. 4500 ft., 23.xii.1937; they were running about on a large living millipede which was crawling on a path (Scott and Britton). All specimens in the British Museum collection, except one paratype in coll. Schmitz.

Judging from further information from Dr. Hugh Scott (contained in a letter from Dr. F. W. Edwards to me) the association of the Phorid, described above, with the millipede, was not one of chance, for even when the flies were repeatedly driven away from the millipede, they immediately came back again. It must have been a case either of phoresy or of parasitism.

In fact, phoresy with myriapods has already been observed in Africa; but in this case the Diptera on the millipedes were not PHORIDAE, but BORBORIDAE (E. Rouhaud, 1916, "Nouvelles observations de phorésie chez les Diptères du groupe des Borboridae", *Bull. Soc. zool. France* 41: 43). Also in the case observed by Dr. Scott, the fact that most of the Phorids were males would indicate phoresy. For among the parasitic PHORIDAE it is almost always only the females which seek out and pursue the host. In the case of ants this fact is very noticeable.

Nevertheless, I believe that the Phorids discovered by Dr. Scott are true parasites of myriapods. For *Megaselia equitans* is morphologically very closely related to two other species of the same genus and subgenus, namely, *Megaselia juli* (Brues) and *M. elongata* (Wood), both of which are parasites of myriapods.

As to *Megaselia juli*, another yellow species, from North America, there is not the slightest doubt that it is an endoparasite of myriapods, as, for example, *Spirobolus marginatus* Say. All the references to the literature on that subject are to be found in an article by Frederick Knab: "Some earlier observations on the habits of *Aphiochaeta juli* Brues" (1913, *Insec. Inscit. Menstr.*

1 : 24). The parasitism of *Megaselia elongata* (Wood) (Europe) is proved by the observations of F. Picard : "Sur le parasitisme d'un Phoride (*Megaselia cuspidata* Schmitz) aux dépens d'un Myriapode" (1930, *Bull. Soc. zool. France* 55 : 180-183). *M. cuspidata* Schmitz is a synonym of *M. elongata* (Wood), as I have lately recognised by the comparison of typical specimens.

To the same group and within the same subgenus *Aphiochaeta*, of which the species *juli*, *elongata*, and *equitans* form part, belongs yet another, a very rare European species, *Megaselia* (*Aphiochaeta*) *pungens* (Lundbeck). The female of this species remains as yet unknown. One could even now safely say that it will be found to be an endoparasite of myriapods.

## DISCOVERY OF A NEW GALL-WASP IN BRITAIN (HYMEN. CYNIPIDAE)

By M. NIBLETT.

### DESCRIPTION

By Dr. H. HEDICKE.

Communicated by G. J. KERRICH, F.R.E.S.

WHILE searching for Lepidopterous larvae at Burnham-on-Crouch, Essex, on 31st March, 1934, a friend, Mr. S. Wakely, noticed some small larvae in cells in some of the stems he had cut open and, thinking they might be of some interest to me, very kindly collected a number of stems. The larvae proved to be Cynipid, and I awaited with some interest the emergence of the imagines. The identity of the plant was in doubt, as it was not an easy matter to determine it from pieces of old dead stem. I sent some of the stems to the Royal Botanic Gardens, Kew, and received them back with a note from the Director to the effect that they had been identified as *Picris echioides* L., a plant with which I was not very familiar. I have found the plant since in several localities in Surrey, but in no instance has it contained any galls.

The first emergence occurred on 12.vi.34, when two gall-wasps emerged, followed by (9) 15.vi.34, (7) 20.vi.34, (2) 22.vi.34, (4) 25.vi. 34, (1) 28.vi.34, (1) 2.vii.34. In addition three Chalcids (PTEROMALIDAE) emerged 10.vii.34.

Not being able to find any record of *Picris echioides* L. as the host-plant of a Cynipid, I sent specimens to Mr. G. J. Kerrich, who replied that it was his opinion that it was a species new to science and suggested that I should submit them to Dr. H. Hedicke. Dr. Hedicke very kindly examined the specimens and pronounced them to be of a new species. His description of the insect is given at the end of this paper.

The following year (1935) I was provided with more material from the same source, and from this I bred another series of insects. The first emergence was on 23.vi.35, and was a Chalcid : a number of these emerged during June and July, the latest date being 13th July. The gall-wasp emerged freely in June and, curiously enough, the first emergence, 12.vi.35, coincided with the first in 1934 ; while the last, 3.vii.35, was a day later than that of the previous year.

I should like to take this opportunity of thanking all those whose kind assistance has enabled me to put this new species on record.



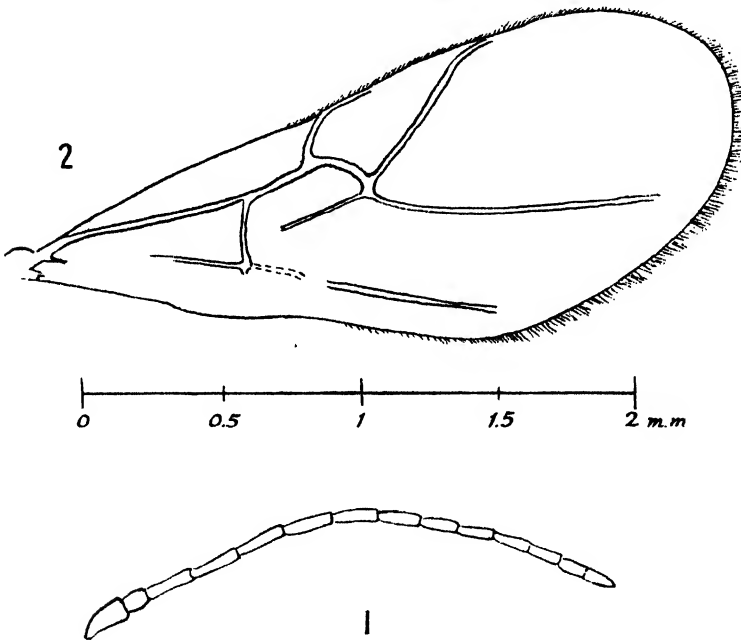
## DESCRIPTION OF THE GALL.

The gall (of which there is no indication from the outside) consists of an ellipsoidal cell in the pith of the stem of *Picris echinoides* L. The longer axis of the gall lies in a plane with the major axis of the stem; it is similar to the gall caused by *Phanacis centaureae* (Kalt.) in the stems of *Centaurea* spp., but is slightly larger: length 2.5 mm. The adult insect makes its exit through a hole bored in the stem-wall. In stems in which a large proportion of the pith has disappeared the cells containing the larvae appear to retain a certain amount of pith around them, giving an impression that an area beyond the wall of the cell is affected by the larvae.

*Aylax caulicola* sp. n. ♀.

[DESCRIPTION BY DR. H. HEDICKE TRANSLATED FROM THE GERMAN BY  
G. J. KERRICH.]

Black; antennae brown, apically darkened, first and second segments black; mandibles red-brown, apically black; wing-veins brown; legs brown, with coxae and trochanters



FIGS. 1-2.—*Aylax caulicola* sp. n. 1, antenna; 2, fore-wing.

black, with femora usually largely darkened to black. Head and thorax very shortly and finely white-pubescent; pleura and propodeum more strongly and in part more densely hairy. Head broader than high: frons and vertex very finely leathery-rugose. Antennae (fig. 1) fourteen segmented; the two apical segments sometimes coalesced; segments 3 and 4 equal in length. Thorax including scutellum leathery-rugose, with only the perpendicular sides of the scutellum partly smooth and shining. Notaulices very well-marked, not quite percurrent: median furrow often almost reaching the fore margin of the mesonotum. Scutellum with basal pits flat-bottomed, leathery-rugose, sometimes indistinctly separated; dorsally with a shallow median furrow, sometimes indistinct or absent. Wings (fig. 2)

finely hairy and ciliated : radial cell distinctly closed at base of fore margin, about twice as long as broad : areolet absent : cubitalis almost reaching apex of wing. *Abdomen* as long as head and thorax together, laterally compressed, about one and a half times as high as thick : its surface smooth and shining, the last two tergites very finely punctate.

Length 2-2.4 mm.

Described from twenty-two females. Holotype and eight paratypes in coll. Hedicke, thirteen paratypes in coll. Niblett.

The leathery sculpture of the thorax relates this species to *A. serratulae* (Mayr); but in the latter the notaulices are not shortened anteriorly, the radial cell is entirely open, and the wings are ciliated.

## A NEW SPECIES OF THE GENUS *CHILO* (LEP., PYRALIDAE)

By G. A. BISSET, B.Sc., F.R.E.S.

THE species described below was bred from sugar-cane in Gurdaspur in the Punjab in August 1936, nine specimens being sent for identification. It agrees in all given characters defining the genus *Chilo* Zinck., and belongs to that genus according to the key to the CRAMBINAE provided by Hampson (1895, *Proc. zool. Soc. Lond.* 1895 : 931). The genitalia, however, differ considerably from those of the species examined belonging to that genus, and I feel uncertain of its true position.

Figures of the genitalia of two of the commonest pests belonging to the genus, neither of which has been figured previously, are given for comparison. The main points to notice are the differences in the saccus, the aedeagus and the anellus.

1. *Chilo suppressalis* Walker 1863 = *simplex* Butler 1880 figs. 1 and 2.
2. *Chilo zonellus* Swinhoe 1884 = *partellus* Swinhoe 1885 figs. 3 and 4.
3. *Chilo trypetes* sp. n., figs. 5 and 6.

### *Chilo trypetes* sp. n.

♂. 25-27 mm. Dorsal and lateral surfaces of the palpi, thorax and abdomen, and the upper surface of the fore-wing light drab, mixed with dusky brown scales. Termen of fore-wing with seven darkish spots between the veins. Under surfaces lighter to white. Hind-wings white. Labial palpi projecting forwards more than twice the length of the head; second segment twice as long as third. Head with a conical prominence ending in a sharp point; underside of prominence flattened, the edge of the flat surface being slightly produced in front to a point directly beneath the other. Antennae serrate and finely ciliated. Genitalia (fig. 5).

♀. 29-32 mm. Similar to ♂ but fewer dusky brown scales on the fore-wings and the antennae simple. Genitalia (fig. 6).

Holotype ♂, allotype ♀, paratypes 1 ♂, 6 ♀♀. INDIA : Punjab, Gurdaspur (*D. Nath*) 17-19.viii.36. In British Museum.

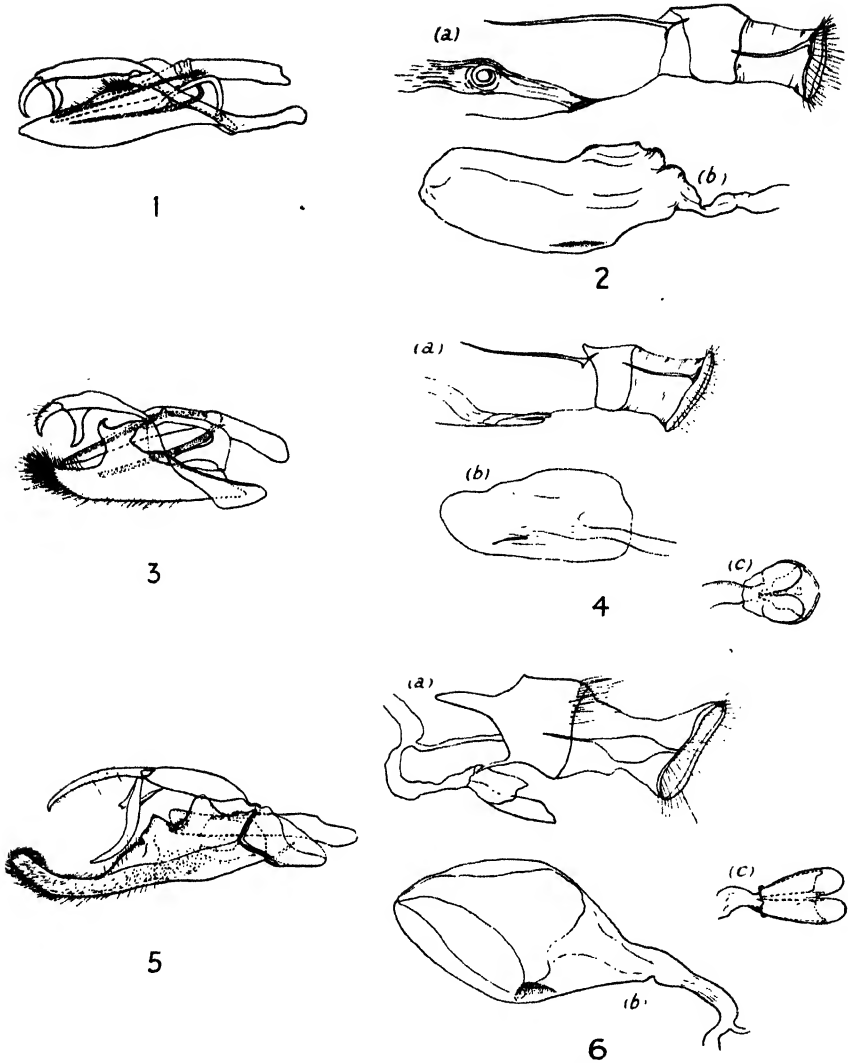


FIG. 1 *Chilo suppressalis* ♂ genitalia. FIG. 2, *Chilo suppressalis* ♀ (a) ovipositor and opening of ductus bursae, (b) bursa copulatrix showing signum. FIG. 3, *Chilo zonellus* ♂ genitalia. FIG. 4, *Chilo zonellus* ♀ (a) ovipositor and opening of ductus bursae, (b) bursa copulatrix showing signum, (c) sclerotised plate at opening of ductus bursae. FIG. 5, *Chilo trypetes* ♂ genitalia. FIG. 6, *Chilo trypetes* ♀ (a) ovipositor and opening of ductus bursae, (b) bursa copulatrix showing signum, (c) sclerotised plate at opening of ductus bursae.

# BEITRÄGE ZUR KENNTNIS DER *BEMBIDION*-ARTEN DES FERNEN OSTENS (JAPAN, KOREA, OSTSIBIRIEN) (COLEOPTERA)

## 3. Mitteilung.<sup>1</sup>

Von Dr. Fritz NETOLITZKY.

Communicated by H. E. ANDREWES, F.R.E.S.

The types of the new species described below are in H. E. Andrewes' collection.

### ***Bembidion* (*Plataphodes*) *nuncaestimatum* sp. n.**

VON den nordeurasiatischen Arten (*B. difficile* Motsch., *fellmani* Mannh. und *aeruginosum* Gebl.<sup>2</sup>) ist eine in Japan vorkommende Art folgendermassen zu trennen und also zu charakterisieren:

Die Schulterbildung weist das Tier in die Untergattung *Plataphodes*, denn der abgekürzte Basalrand reicht bis zur vierten Furche der Flügeldecken. Dieser Basalrand ist aber in seinem Verlaufe nicht so deutlich abgelenkt oder geschwungen wie bei den zum Vergleiche dienenden Arten, sondern die gleichmässige Krümmung reicht bis zur Wurzel der fünften Furche, um dann in wenig veränderter Richtung zur Basis des vierten Streifens zu ziehen. Es ist also der vereinigte Seiten- und Basalrand ein fast gleichmässiges Bogenstück geworden, ähnlich wie beim Subgenus *Plataphus*, aber dennoch ist die Unterbrechung in der Richtung (unter den Binokular) deutlich wahrzunehmen.

Die tiefen und vollständigen Furchen der Flügeldecken sind nicht punktiert. Es unterscheidet sich *nuncaestimatum* in der Form, Skulptur und Färbung nicht wesentlich von den oben genannten Arten, nur besteht die Mikroskulptur der Flügeldecken aus enger gestellten Querlinien, während bei gleicher Vergrösserung bei *B. difficile* etc ein Netzwerk aus Maschen kenntlich ist. Farbe der Oberseite schwarz-oliv mit angedeutetem Blauschimmer der Flügeldecken. Länge 5-5.5 mm.

Fundort JAPAN: Oku Nikko Nebazawa 8.ix.1937 (Y. Yano), 2 Exempl.

### ***Bembidion* (*Plataphodes*) *kuprianovi* Mannh. *oxydatum* subsp. n.**

Vor Jahren sah ich durch gütige Vermittlung von J. Sahlberg das einzige Stück "*P. kuprianovi* ♀ Kuprianoff Sitka" in der Coll. Mannerheim und ich konnte mit diesem mehrere Exemplare der Coll. Genova "*Alaska, Wickham*" gleichsetzen.

*B. kuprianovi* zeigt den für das Subg. *Plataphodes* charakteristischen abgekürzten, dabei mehr weniger winkelig abgesetzten und bis zur Basis der vierten Furche reichenden Basalrand der Schulter. Von aller zirkumpolaren<sup>3</sup> Arten verschieden ist die Färbung

<sup>1</sup> 1938, *Proc. R. ent. Soc. Lond.* (B) 7: 37; *ibidem*: 52.

<sup>2</sup> Vergl. Holdhaus, K., 1932, Die borealpinen Arten der Gattung *Bembidion* (*Soc. ent. Fr. Livre du Centenaire*: 353 ff.). Auch die zum Vergleiche dienenden Arten: *quadrifoveolatum*, *crenulatum* und *kuprianovi* sind von der japanischen Art verschieden.

<sup>3</sup> *Plataphodes*-Arten fehlen in Island und Grönland, daher richtiger "semicircumpolare" Verbreitung.

“antennarum basi tibiis tarsisque rufo-piceis”; auch die Flügeldecken haben einen bräunlichen Farbton, so dass man fast glauben könnte unausgefärbte Stücke vor sich zu haben, was aber nicht der Fall ist. Die Eiform der Flügeldecken ist auffallend, ebenso ihre vier fast grubchen-artigen Porenpunkte am dritten Streifen, von denen Mannerheim irrtümlich sagt, dass sie im dritten Zwischenraume liegen (“interstitio tertio punctis duobus impressis”). Richtig ist vielmehr, dass die Fühlborste knapp an der dritten Furche steht und dass nur die vergrößerten Grübchen in den dritten Zwischenraum reichen.

Mit *P. kuprianovi* ist *P. ovipenis* Motsch. gleichzusetzen, wie mich die Type Motschulsky's lehrte (*Mitt. Ges. Luxemb. Naturfr.* 1935:23), ebenso *B. bucolicum* Casey, von dem ich 2 Locotypen besitze (“Stikine River Cañon *B. C. Wickham*”). Casey hat das Tier in sein völlig unzureichend charakterisiertes Subg. *Lionepha* gestellt. Mit *kuprianovi* ist vielleicht auch *B. funereum* Lec. gleichzusetzen, doch muss ein Typenvergleich diese Vermutung erst bestätigen, weil tatsächlich ein sehr ähnlich gestaltetes und gefärbtes *Bembidion*, jedoch mit anderer, *Plataphus*-artiger Schulterbildung in verschiedenen alten Museumsammlungen unter diesem Namen aus Californien steckt.

Das aus Japan stammende, mit *kuprianovi* in Bezug auf Skulptur und Färbung nahezu gleichzusetzende Tier ist nur etwas kleiner (3·8–4·1 mm. gegen 4·5–5·0 mm.) und vor allen Dingen sind alle sieben Furchen der Flügeldecken wesentlich tiefer und bis ans Ende gleichmässig eingegraben, während *B. kuprianovi* nur eine sehr seichte Furchung aufweist. Die Mikroskulptur der Flügeldecken besteht bei *kuprianovi* aus etwas deutlicheren Maschen als bei ssp. *oxydatum* (gleiche mikroskopische Vergrößerung vorausgesetzt).

Fundort JAPAN: Oku Nikko, Nebazawa 9.ix.1937 (*Y. Yano*), 2 Exemplare.

Synonymie: <sup>1</sup>*Bembidion* (*Plataphodes*) *kuprianovi* Mannh. (1843, *Bull. Soc. Nat. Mosc.* 16: 217).

### ***Bembidion* (*Trichoplataphus*) *taiwanum* sp. n.**

Wegen der Beborstung der Abdominal-Sternite gehört die neue Art zum Subgen. *Trichoplataphus* und wegen des ausgebildeten siebenten Streifens der Flügeldecken in die nächste Nähe des *B. proteron* Net. (1920, *Ent. Mitt.* 9: 116). Von diesem ist als wesentlichster Unterschied nur hervorzuheben, dass der Halsschild der neuen Art 1½ mal so breit als lang ist und dadurch flacher erscheint, als der des *B. proteron*, welcher so lang als breit ist. Die Seitenrandkehle des Halsschildes von *B. taiwanum* ist viel breiter abgesetzt als bei *B. proteron*; sonst ist die Grösse, die Farbe, die Makro- und Mikroskulptur beider Arten identisch.

Fundort FORMOSA: near Mt. Ari Takasaki 29.xi.1937 (*Y. Yano*), 2 Exemplare.

### ***Bembidion* (*Semicampa*) *mandarin* sp. n.**

Nach meiner Bestimmungstabelle des Subg. *Semicampa* (1922, *Wien. ent. Ztg.* 39: 85–91) kommt man auf *B. guttulum* Chd. und *gassneri* Net., denn der Halsschild ist vor den Hinterecken nicht ausgeschweift und die Flügeldecken sind auf ihrer ganzen Fläche gelb gefleckt und zwar nach dem *Notaphus*-Typus (wie etwa *B. varium* Ol., *fumigatum* Duft. oder *articulatum* Panz.).

<sup>1</sup> *B. ventricosum* Motsch., zu welcher Art ich früher in meinem Kataloge (und Csiki in dem seinen) *B. kuprianovi* als fragliches Synonym gestellt hatte, ist nach der gesehenen Type ein *Blepharoplataphus*, scheidet daher aus der Synonymie hier aus (Vergl. *Netolitzky* in *Mitt. Ges. Luxemburger Naturfr.* 1935: 21).

Die neue Art unterscheidet sich von *B. guttulum* durch die Kleinheit (3.2-3.5 mm.) und dadurch, dass die Mikroskulptur der Halsschildmitte und des Kopfes zwischen den Augen weniger deutlich ist. Die Färbung der Fühler, der Beine und der Flügeldecken ist wie bei *B. guttulum*, im Gegensatz zu *B. gassneri*, welches fast ganz gelbe Fühler und heller gefleckte Flügeldecken besitzt.

Fundort MANCHUKUO: Harbin 12.viii.1937 (*S. Takagi*), 2 Exemplare.

***Bembidion* (*Peryphus*) *amurense* Motsch. *trajectum* subsp. n.**

Anlässlich der Beschreibung des *B. lucillum*<sup>1</sup> erwähnte ich ein Tier, das dem *B. amurense* Motsch. sehr nahe steht. Es ist aber die Basis des Halsschildes bei der neuen Rasse etwas breiter als der Vorderrand (bei *amurense* etwa gleich breit) und nur das erste Fühlerglied ist hell (bei *amurense* sind 2½ oder 3 Basalglieder licht).

Habitus eines *Peryphus* mit vor der Spitze eingedrücktem Metasternalfortsatz zwischen den Mittelhüften; Borsten der Abdominalsternite einfach. Neben dem Porenpunkte der Augen und den parallelen Stirnwülsten finden sich winzige Pünktchen. Halsschild gewölbt, schwach herzförmig, in den rechtwinkligen Hinterecken je ein deutliches und langes Fältchen; Basis punktiert; die Seitenrandkehle sehr schmal (Gegensatz zu *pseudolucillum*). Flügeldecken mit sieben hinten erlöschenden, feinpunktierten Furchen und fast ebenen Zwischenräumen. Die Enden der Flügeldecken sind mässig zugespitzt. Die ganze Oberseite ist schwarzblau, während bei *B. amurense* die Flügeldecken dunkel Kastanienbraun sind. Beine und Fühler pechbraun, nur das erste Glied der Fühler heller. *Mikroskulptur*: Scheitel glatt, ebenso die Halsschildscheibe, während an den Rändern schattenhafte Maschen sind. Die Flügeldecken sind äusserst fein mikroskopisch quer gestreift. Grösse: 3.8-4.2 mm.

Fundort JAPAN: Kamagawa Keu, Sagamigawa 20.vi.1936 (*Y. Yano*), 6 übereinstimmende Exemplare; Ikuecho, Osaka, iii.1933, ein Exemplar (*Y. Yano*); Yodogawa ein ex Coll. Yano.

Das ähnliche *B. nikkoense* hat sehr grobe Punktreihen der Flügeldecken; letztere sind beim Männchen mikroskopisch glatt, während das Weibchen polygonale Maschen besitzt.

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<sup>1</sup> Vergl. 1938, *Proc. R. ent. Soc. Lond.* (B) 7: 38.

## BOOK NOTICE.

*The Microscope and Entomological Monthly*, Vol. 3, no. 1, January 1939. Price 1s. monthly.

Commencing with Volume 3 this journal, formerly known as *The Microscope*, includes in its wrapper a new journal entitled *The Entomological Monthly* [Vol. 1, no. 1]. The Editor for Entomology is E. F. Linssen and the publishers A. Barron Ltd. The aim of the journal is to bridge the gulf "between the publications of the learned societies and the occasional contributions in various popular journals."

## BOOK NOTICE.

*Rhopalocera Javanica. (Derde Gedeelte) Geïllustreerd Overzicht der Dagvlinders van Java door W. Roepke.* 8vo. Wageningen (H. Veenman & Zonen) Publicatie van de Stichting "Fonds Landbouw Export Bureau 1916-1918," No. 22. pp. 235-362, pls. 26-36, figs. 30-53. Price Fl. 2.75.

This volume is the third of a work on Javan Butterflies. It deals with the NYMPHALIDAE, including the genus *Acraea*.

Under each genus is found a key for the determination of Javan species and each species is dealt with individually. An abbreviated synonymy is given, followed by details of geographical distribution and a reference to the half-tone illustration given on the plates. This is followed by a general discussion, and in many cases a figure of the genitalia is given.

In addition to the half-tone plates of butterflies, this volume contains 2 coloured plates of larvae and pupae after originals by M. C. Piepers.

There is an apparent error in the numbering of the genera in this family, genus 16 *Hypolimnas* on p. 275 being followed by genus 16 [sic] *Doleschallia* on p. 282.

# ON THE IDENTITY OF *APANTELES INFIMUS* HALIDAY AND OF *APANTELES INFIMUS* HALIDAY OF MARSHALL (HYM. BRACON.)

By D. S. WILKINSON, F.R.E.S.

(Imperial Institute of Entomology.)

## *Apanteles infimus* Hal.

*Microgaster infimus* Haliday, 1834, *Ent. Mag.* 2: 243. *Apanteles infimus* Haliday, Reinhard, 1881, *Deut. ent. Z.* 25: 44.

♂♂. Black; the extreme apex of the front femora and the extreme base of the hind tibiae, occasionally the extreme base of the four front tibiae and the extreme apex of the middle femora, red testaceous, these areas sometimes quite extensively red testaceous, commonly, however, particularly in the ♂, entirely darkened or black; palpi and front tibial spurs strongly darkened or even black, the tibial spurs of the four posterior legs pale; wings infumated, and the setae coloured; wing-veins, stigma, and metacarp, uniformly brown; stigma uniformly opaque.

♀♂. *Head*: face, clypeus, facial and frontal orbits, and frons, minutely punctate (degree 2); facial depressions nearer to apex of clypeus than to the eyes; vertex exceedingly minutely punctate (degree 1) and/or minutely coriaceous; posterior ocelli equidistant from each other and the eyes; flagellum of ♀ about equal to combined length of thorax and abdomen, of ♂ longer than combined length of thorax and abdomen together with three times the length of the head, about equal to three times the length of the thorax. *Thorax*: mesonotum regularly, closely punctate (degrees 2 and 3) throughout; disc of scutellum smooth and with widely scattered punctures (degree 3); the smooth, non-excavate area of lateral faces of scutellum reaching up to, but not beyond, half-way to base of scutellum, in the ♂ commonly not thus reaching up even half-way; propodeon along the median longitudinal line not depressed, more usually smooth, and rugose at apex, in basal half otherwise punctate (degrees 2 or 3), occasionally quite strongly so (degree 4), the apical angles smooth and shining save for some variable indefinite sculpture. *Wings*: stigma rather shorter than metacarp. *Legs*: hind coxae basally above strongly punctate (degree 4), apically above and on outer faces with well-separated, minute (degree 2) or even exceedingly minute punctures; hind tibial spurs equal, half the length of the basal segment of the hind tarsus. *Abdomen* (figs. 1, 2): 1st tergite basally excavate and aciculate, medially tumescent with this tumescence occasionally in the form of a short blunt carina, the apical half turned over and strongly punctate (degree 4) save for a smooth narrow median longitudinal area, which runs from the median tumescence to the smooth median apical lunule and which is occasionally slightly depressed, the punctures commonly not clearly delimited and with much rugose aciculation, the upper layer of the tergite more usually contracting slightly at apex, and the lower layer not so contracting, with the result that the apical angles of the tergite and commonly also large portions of the apical margin are strongly depressed, the tergite apically emarginate; 2nd tergite with well-separated, minute punctuation across in the apical half, otherwise more or less smooth; 3rd tergite smooth narrowly across apex and broadly across base and in a broad median basal triangle, otherwise with well-separated, minute punctuation, in the ♂ more extensively punctate than in the ♀; succeeding tergites minutely punctate; 3rd and 4th ventrites with a broad median longitudinal excision throughout their basal third, otherwise apparently without median longitudinal suturing; 5th ventrite with median longitudinal suture, and with both its basal and its apical margin strongly sinuate; hypopygium broadly membranous throughout the median line, and its apex membranously acute; ovipositor sheaths equal in length to



the hind tibia, the ovipositor rather shorter than combined length of hind tibia and the four basal segments of the hind tarsus.

*Length*: 2.0–2.5 mm.

Redescribed from the following material:—BRITISH MUSEUM: Haliday Collection, 1 ♀ (*type*), 1 ♂, no. 17; Marshall Collection, 1 ♀, N. Forest; General Collection, Hertfordshire, Boxmoor, 3 ♀♀, 2.vi.1936, 24.vii.1937, Bricket Wood, 5 ♀♀, 1 ♂, 8.vii.1937, Buckinghamshire, Brickhill, 1 ♀, 21.vi.1937 (*R. B. Benson*). PLYMOUTH MUSEUM: Bignell Collection: a card of two (2 ♀♀), reg. no. 2909A, Yealverton, 4.viii.1885, det. as *sicarius* Marsh.; 2 ♀♀, reg. no. 3969, in register dated 16.vi.1891 (*J. H. Wood*), det. as *infimus* Hal. NORWICH CASTLE MUSEUM: Bridgman Collection, 1 ♀, reg. no. 697, det. as ? *infimus* Hal., in register dated vi.1886 (*W. H. B. Fletcher*). ESSEX FIELD CLUB: Fitch Collection, 1 ♀, nos.

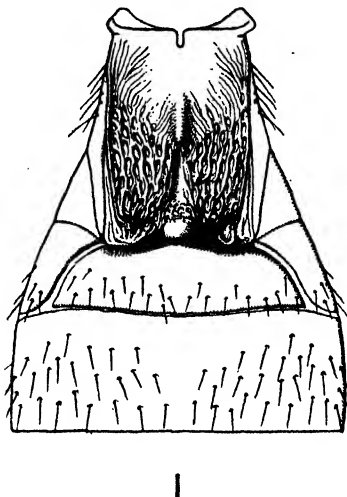


FIG. 1.—*Apanteles infimus* Hal., basal tergites, ♀. × 80.

177 and A3467. OXFORD UNIVERSITY MUSEUM: Binsey, 2 ♀♀, 1 ♂, coll. ix.1925, em. 25.vii.1926, 29.vii.1926, 4.viii.1926 (*E. G. R. Waters*). A. C. W. WAGNER'S COLLECTION: Haake, 17.vii., ser. no. 394, det. Schmiedeknecht as *infimus* Hal. D. S. WILKINSON'S COLLECTION: England, Hampshire, Brockenhurst, 8 ♀♀, 12 ♂♂, 28.vi.1933, 25–28.vi.1933 (*G. Nixon*), North Devon, Romansleigh, 210 ♀♀, 128 ♂♂, 26.vii.1938 (*R. L. E. Ford*).

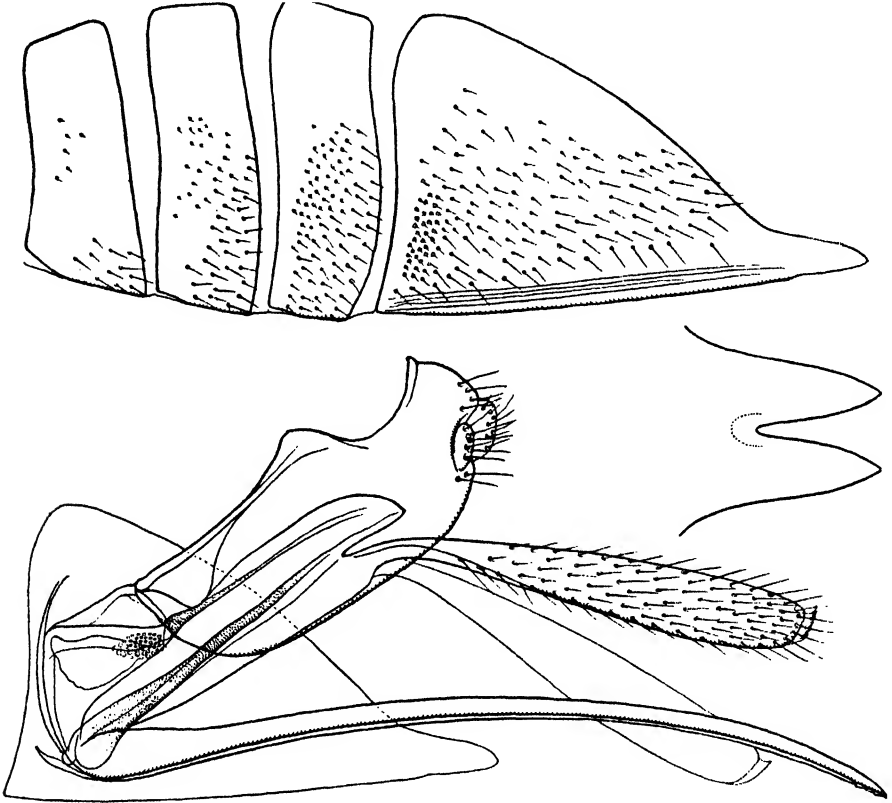
Further material examined:—ZOOLOGISCHES MUSEUM DER UNIVERSITÄT, BERLIN: Reinhard Collection, 2 ♀♀, 2 ♂♂, mus. ser. no. 26962, det. as *infimus* Hal. IMPERIAL INSTITUTE OF ENTOMOLOGY: Goyt Valley, Cheshire, 3 ♀♀, 26.vii.1936 (*H. Britten*).

*Type* in the British Museum.

*Host*. The original description of *infimus* is without host record. Of the material from which I have redescribed the species, Bridgman's single female is recorded in his register to have been bred from the Tineid *Coleophora apicella* Staint., now known as *C. lineola* Haw., Bignell's two females no. 3969 to have been bred from a species of *Coleophora*, and Waters' material from a species of *Coleophora* on *Juncus articulatus*. Nixon's series, and Ford's long series from Romansleigh, were swept from *Juncus*. Ford reports that the *Juncus* from which he obtained his material was in a very wet, boggy area, and that

*Coleophora caespititiella* Zell. was in abundance. The remainder of the material is without host record.

Marshall's records of hosts for *infimus*, namely the Tineid *Acrolepia pygmaeana* Haw. and the Tineid *Chauliodus*, now *Epermenia chaerophyllella* Göze, are to be ignored since the *Apanteles* he had before him was not *infimus*. Brischke's records also, namely the Geometrid *Pseudoterpna cythisaria* Schiff., now *P. pruinata* Hufn., and the Tineid *Oecophora noricella* Zell., a species



## 2

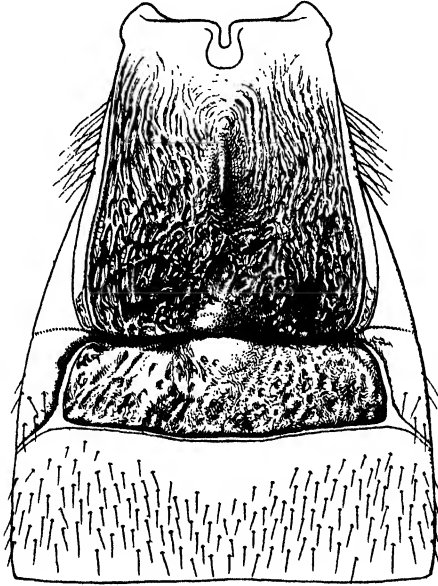
FIG. 2.—*Apanteles infimus* Hal., apical ventrites and, below, genitalia, side view, ♀,  $\times 80$ ; and apex of hypopygium, opened out, dorsal view, further much enlarged, to show apical slit.

referred by Marshall to the genus *Butalis*, but nowadays to *Scythris*, are certainly to be ignored, although I have not seen the *Apanteles* material upon which they were based.

*Cocoons* unknown. Brischke's record of gregarious, yellow, woolly cocoons cannot possibly be accepted.

*Commentary.* Haliday originally described his *infimus* from an unstated number of specimens of both sexes in the collection of the Entomological Society of London, "*(Mus. Soc. Ent.)*," the material having been captured, the habitat being given as "*ad litora minus frequens*." In the British Museum,

amongst the remains of the material presented by the Entomological Society and bearing the correct museum register number showing that it was part of this material, and labelled "*infimus*" and "17," was a single female agreeing perfectly and in the minutest detail with Haliday's original description. I propose to accept this female as the type, which almost undoubtedly it is; and I am so labelling it. It agrees perfectly and in the minutest detail with all the other material before me from which I have redescribed the species, and notably also, which is extremely satisfactory, with all the material in the Reinhard Collection determined as this species by Reinhard, who is the first reviser. The single female recorded by me above from the Marshall Collection was not referred to by Marshall under the name *infimus*, Marshall's interpretation of *infimus* being an altogether different species.



## 3

FIG. 3.—*Apanteles imperator* sp. n., basal tergites, ♀. × 80.

This female I am accepting as the type of *infimus* is unique, also, in being the only specimen in the Haliday Collection from the Entomological Society with a name-label. It may also be remarked that it agrees with Haliday's description even as to the length and shape of the abdomen and tergites relative to *albipennis* Hal., now known as *halidavi* Marsh., the species referred to by Haliday as that one immediately preceding. This latter species was also described from the "*Mus. Soc. Ent.*," and in the Entomological Society's collection there was, also, a female agreeing perfectly with the original description of *albipennis*.

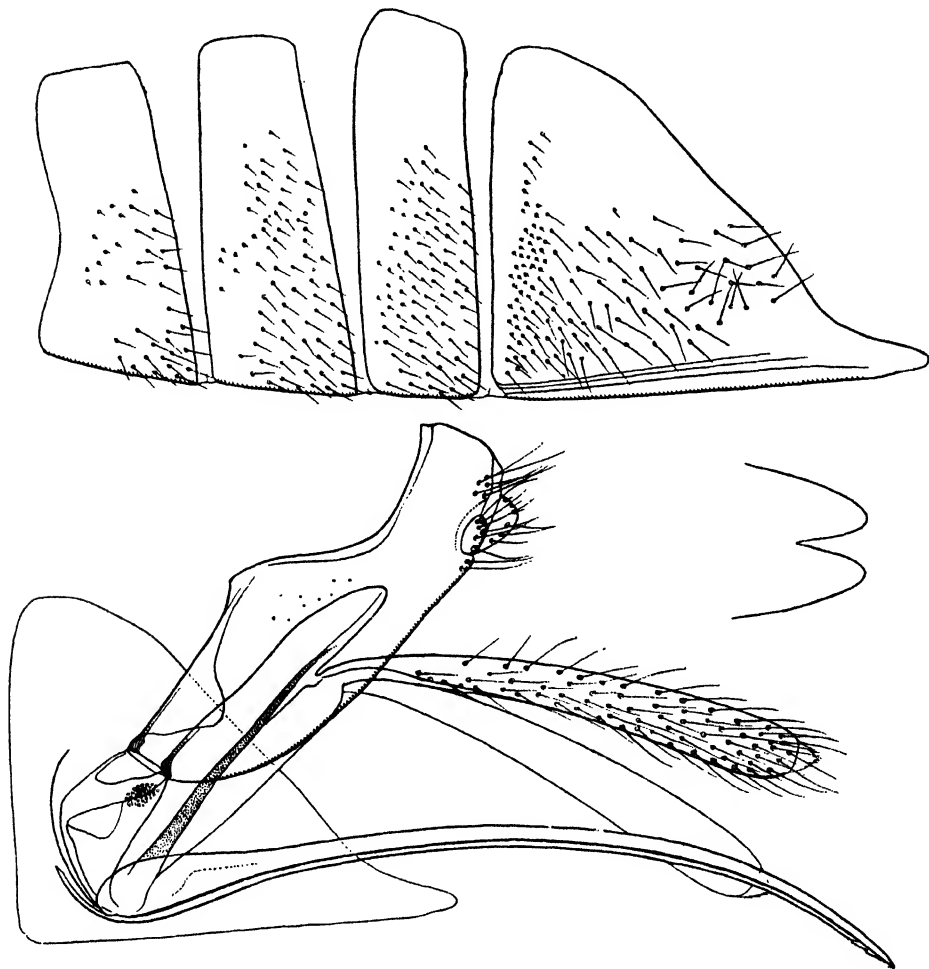
*Apanteles infimus* Hal. runs in my key (1932, *Trans. ent. Soc. Lond.* 80, and as subsequently emended, especially in 1938, *Proc. R. ent. Soc. Lond.* (B) 7 : 133) to couplet 109, which should be altered as follows :—

- |   |                     |
|---|---------------------|
| 109. Ovipositor sheaths equal in length to hind tibia; Europe . . . | <i>infimus</i> Hal. |
| Ovipositor sheaths longer than hind tibia . . . . .                 | 109a.               |
| Ovipositor sheaths shorter than hind tibia . . . . .                | 121.                |

***Apanteles imperator* sp. n.**

*Apanteles infimus* Haliday, Marshall, 1885, *Trans. ent. Soc. Lond.* **1885**: 204 (excl. syn.); 1888, *Species Hymén. d'Eur.* **4**: 461-462.

♀. Black; apex of front femora, front tibiae wholly (save for some slight darkening), extreme apex of middle femora, about basal half or three-fifths of middle tibiae, about



4

FIG. 4.—*Apanteles imperator* sp. n., apical ventrites and, below, genitalia, side view, ♀,  $\times 80$ ; and apex of hypopygium, opened out, dorsal view, further much enlarged, to show apical slit.

basal three-fifths or three-fourths of hind tibiae, and extreme base of basal segment of hind tarsus, red testaceous; front tarsi slightly, and middle tarsus and palpi strongly, darkened; tibial spurs pale; wings infumated, or even strongly infumated, evenly throughout, and the setae coloured; stigma, metacarp, and wing-veins, uniformly brown; stigma uniformly opaque.

♂. Black; apex or even only extreme apex of front femora, perhaps occasionally extreme apex of middle femora, base or extreme base of the four anterior tibiae, and base of hind tibiae, red testaceous; front tarsi and palpi strongly darkened; tibial spurs pale: wings as in ♀.

♀♂. *Head*: face, clypeus, frontal orbits, and frons, minutely punctate (degree 2), the vertex exceedingly minutely punctate (degree 1); facial depressions much nearer to apex of clypeus than to the eyes; posterior ocelli equidistant from each other and the eyes; flagellum of ♀ longer than combined length of thorax and abdomen, shorter than combined length of head, thorax, and abdomen, of ♂ about equal to or rather longer than combined length of thorax and abdomen together with three times the length of the head. *Thorax*: mesonotum with regularly, rather closely placed minute punctation throughout (degrees 2 and 1), entirely smooth across extreme apex; disc of scutellum with minute punctation throughout (degree 1), the punctures more widely placed than on the mesonotum; the smooth, non-excavate area of lateral faces of scutellum reaching up about half-way to base of scutellum, but not beyond half-way; metanotal suture comprised of two arcs so shaped and joined medially that the metanotum medially at apex is noticeably pointed and the propodeon medially at base noticeably excised; propodeon narrowly across base smooth save for some minute punctation, otherwise rugose save commonly in the apical angles, the slightly sunken rugulose areola often further delimited—sometimes noticeably so—by two or three or more carinulae, and costulae apparently more or less present comprised also of such carinulae, but carinulae in these regions of the propodeon are commonly merely rugosities which in no way delimitate an areola or form costulae. *Wings*: metacarp and stigma about equal in length. *Legs*: hind coxae basally above strongly closely punctate (degrees 3 and 4), apically above and on outer faces throughout with well-separated minute punctation; hind tibial spurs equal, half the length of the basal segment of the hind tarsus. *Abdomen* (figs. 3, 4): 1st tergite basally excavate and aciculate or rugulose, medially tumescent and rugulose or rugose, in apical half turned over and rugose and commonly with a slight median impression, across extreme apex depressed on each side of the median apical lunule, which is present but which is not strongly evident, the tergite apically strongly emarginate; 2nd tergite rugulose; 3rd tergite smooth narrowly across apex and base, and in a median basal triangle, otherwise with minute punctation; succeeding tergites minutely punctate; 2nd, 3rd, 4th, and 5th ventrites with median longitudinal suture; hypopygium broadly membranous throughout the median line, and its apex membranously acute; ovipositor sheaths shorter than the hind tibia, equal in length to or just shorter than combined length of the three basal segments of the hind tarsus, the ovipositor longer than hind tarsus, shorter than combined length of hind tibia and the basal segment of the hind tarsus.

*Length*: 2.5–3.0 mm.

Described from the following material:—BRITISH MUSEUM: Marshall Collection, 1 ♀, "N," 1.ix.1884, det. Marshall as *infimus* Hal., 1 ♂, "N," 1.ix.1884; Lyle Collection, Kerton, Boston, a card of three (3 ♀♀), 1925, ser. no. 4962 (*H. W. Miles*), in register dated 15–17.ix.1925, New Forest, 1 ♂, 14.v.1917, ser. no. 3099 (*G. T. Lyle*), all det. Lyle as *infimus* Hal.; General Collection, England, Kent, Bexley, 2 ♀♀, 1 ♂, 18.viii.1935, 3 ♀♀, 1 ♂, viii.1935, 3 ♂♂, 16.ix.1935, Isle of Wight, Yarmouth, 2 ♀♀, 1 ♂, 22.viii.1935 (*R. L. E. Ford*), Isle of Wight, Yarmouth, 1 ♀, 1.ix.1935 (*L. T. Ford*), South Hampshire, Farley, 2 ♀♀, 12.vi.1938 (*R. B. Benson*). ESSEX FIELD CLUB: Fitch Collection, a card of three (2 ♀♀, 1 ♂), 4.ix.1884 (*G. Elisha*), 2 ♀♀, 1 ♂, 1 ♀, ser. no. 1, and 3 ♀♀, 2 ♂♂, all det. as *infimus* Hal. ZOOLOGISCHES MUSEUM DER UNIVERSITÄT, BERLIN: Güntersberga O., 2 ♀♀, 5.ix.1928 (*M. Hering*). BUNDESANSTALT FÜR PFLANZEN-SCHUTZ, WIEN: Bohemia, Thammühl bei Böhmisches Leipa, 1 ♀, 20.viii.

1936 (Zimmermann). NATURHISTORISKA RIKSMUSEUM, STOCKHOLM : Germany, Saxony, 3 ♀♀, 1 ♂, ser. no. 208 (*Herr Schütze per Dr. A. Roman*). D. S. WILKINSON'S COLLECTION : England, Oxford, Charlbury, 3 ♀♀, 1 ♂, v.1934 (*Dr. Hugh Scott*), Kent, Bexley, 23 ♀♀ (one the *type*), 13 ♂♂, coll. 12.vi.1937, em. 2.vii.1937, 5 ♀♀, 3 ♂♂, pup. 1.viii.1937, em. 16.viii.1937, Dartford Heath, 1 ♀, coll. 24.iv.1938, em. 16.v.1938, 1 ♀, coll. 6.iv.1938, em. 25.v.1938, Sussex, Ditchling, 5 ♀♀, 5 ♂♂, coll. vi.1937, em. 14.vii.1937, Cambridge, 9 ♀♀, 1 ♂, coll. 26.viii.1937, em. 20.ix.1937 (*R. L. E. Ford*).

*Type* deposited in the British Museum.

*Host.* For the material from which I have here described this species seven hosts are recorded. Elisha's series of three in the Fitch Collection, namely, part of the material referred to by Marshall under the name *A. infimus* Hal., the three females bred by Miles, Ford's series from Cambridge, and all material from Bexley, is recorded to have been bred from the Tineid *Epermenia chaerophyllella* Göze. The three females and two males without other data in the Fitch Collection, Hering's two females, Schütze's four specimens, and both series from Yarmouth, are recorded to have been bred from the Tineid *Acrolepia pygmaeana* Haw. Zimmermann's single female from Bohemia is recorded from the Tineid *Depressaria heracliana* de Geer, Ford's series from Ditchling from *Depressaria nervosa* Haw., and Lyle's single male and Ford's single female from Dartford Heath collected April 24th, from *Depressaria assimilella* Treits. Dr. Scott records that he bred his series from Charlbury from the Tineid *Plutella porrectella* L., and, finally, Ford bred his other single female from Dartford Heath from the Geometrid *Eucestia spartiata* Herbst, now known as *Chesias legatella* Schiff. The two Marshall specimens seem to be without host record, and Benson's two females were swept.

Some of the information with regard to the host-plants of the various hosts that I have recorded above is not without interest, since such information may well ultimately assist towards determining the life-cycle of the *Apanteles*; for, although it can be seen that the *Apanteles* certainly has four broods in the year, its complete life-cycle and how it passes the winter are still unknown. Ford's series from Bexley with emergence date 2.vii.1937 was bred from the first brood of the host, *E. chaerophyllella*. This first brood occurs, Ford tells me, on the underside of the lower leaves of cow parsley, *Heracleum panaces* L., and the host larva and the *Apanteles* cocoons are external. Ford's series from Bexley with emergence date 16.viii.1937 was bred from the second brood of the host. This second brood occurs on the underside of the lower leaves of hogweed, *Heracleum sphondylium* L., and, as before, the host larva and the *Apanteles* cocoons are external. Ford's series from Cambridge with emergence date 20.ix.1937 was bred from the third brood of this same host, which sometimes occurs, and on the same plant as the second brood. One of the other hosts of this *Apanteles* also feeds on hogweed, namely *Depressaria heracliana*. In this case, I understand from Ford, the host larva feeds in a mass in the blossom of the plant, and the *Apanteles* cocoon is to be found in this mass. *Depressaria assimilella*, on the other hand, occurs on common broom, *Cytisus scoparius* Link, and draws together some three or four upper shoots to form a tube, in which it lives and in which the *Apanteles* cocoon is to be found; while *D. nervosa*, on the Hemlock water dropwort, *Oenanthe crocata* L., although it feeds on the blossom, pupates inside a hollow stem of the plant, and the *Apanteles* cocoon occurs inside this hollow stem. The host *Acrolepia pygmaeana* occurs on Bittersweet nightshade, *Solanum dulcamara* L., and the *Apanteles* cocoon is found inside the leaf-blister made by the host-larva. In the case of

*Plutella porrectella*, which feeds on Sweet rocket, *Hesperis matronalis* L., the *Apanteles* cocoon occurs inside the thin, reticulate puparium of its host. Finally, I must remark that the Geometrid host, *E. spartiata*, a record that might possibly have been queried, and one that Ford is sure is accurate, is another species that occurs on broom.

Cocoons white.

*Commentary.* This species was considered by Marshall to be *infimus* Hal., and so referred to by him. It is not *infimus*, as I have just shown, and neither is it referable, I am convinced, to any other described palaearctic species, by far the greater majority of the types of which are known to me and have been studied by me for the monograph of this genus I have in preparation. In Muesebeck's key (1920) of the Nearctic species, which must be considered, *imperator* will run apparently only so far as couplet 45, and no further. In my own key (1932, *Trans. ent. Soc. Lond.* 80, and as subsequently emended and enlarged) it runs in Group U to couplet 124, which should be altered as follows:—

124. Wings infumated; stigma uniformly opaque; Europe . . . *imperator* Wilkn.  
 Wings hyaline; stigma discally hyaline . . . . . 124a.  
 124a. [as existing 124]

In Group S, in which also, I think, it is advisable to include it, the species runs easily to couplet 195, which should be altered as follows:—

195. Wings infumated, even strongly so; carinae of areola and costulae comprised of two or three or more carinulae, giving a rugose effect . . . 195a.  
 Wings not or hardly infumated; carinae of areola and costulae strong . . . 196.  
 195a. Mesonotum with closely placed, quite strong punctation (degree 3 or 3-4); hind coxae above apparently entirely smooth; 2nd suture apparently wanting; Uganda . . . . . *atellae* Wilkn.  
 Mesonotum minutely punctate (degree 2); hind coxae basally above strongly punctate (degree 3 or 3-4); 2nd suture strongly marked; Europe . . . . . *imperator* Wilkn.

## THE IDENTITY OF *CHOPARDINA IMPORTATA* UVAROV, 1921 (ORTHOPTERA, GRYLLACRIDIDAE)

By B. P. UVAROV, D.Sc., F.R.E.S.

IN 1921 I described (1921, *Ent. mon. Mag.* 57: 206) a new genus and species of wingless long-horned grasshopper from a single specimen taken in a greenhouse at Richmond, Surrey, and named it *Chopardina importata*, as its exotic origin was beyond doubt.

Karny (1937, *Gen. Insect.* 206: 254) has relegated *Chopardina* as a synonym of the genus *Dolichopoda* Bolivar, 1880, comprising a number of species living in caves of the Mediterranean region. My chief reason for regarding *Chopardina* as distinct generically from *Dolichopoda* was the presence of series of spines on the underside of posterior femur. These spines are absent in all species of *Dolichopoda* with the single exception of *D. bormansi* Brunner, 1882, in which posterior femora are strongly spinose. At the time of my description of *Chopardina* no specimens of *D. bormansi* were in the British Museum collection, but since then several have been received, and a direct comparison proves that *Chopardina importata* Uvarov, 1921, is a pure synonym of *Dolichopoda bormansi* Brunner, 1882 (*syn. n.*).

It is of interest to record that *D. bormansi* is found only in a few caves in Corsica, and the specimens described as *Chopardina importata* must have been brought into this country with some plants taken at least near the caves.

## NOTES ON ALYSIINAE WITH DESCRIPTIONS OF THREE NEW SPECIES (HYM., BRACONIDAE)

By G. E. J. NIXON, B.A., F.R.E.S.

(Imperial Institute of Entomology.)

NAMES have been specially requested for a species of *Phaenocarpa* parasitic on *Chaetodacus passiflorae* (Frogg.) in Fiji and for a species of *Aphaereta* parasitic on *Chortophila brassicae* (Bouché) in Morocco. Both these insects are described below as new. The description of the *Aphaereta* is accompanied by brief notes on the three other species of the genus known to me to occur in Europe.

### *Aphaereta* Förster.

This genus presents a difficult taxonomic problem. It seems that the species show a considerable range in habit, though in appearance they are extremely similar. For example, the females of *Aphaereta* seek their hosts in such diverse media as decaying seaweed, carrion, excrement and the tissues of certain cruciferous plants, and for parasitisation they are now known to select hosts from among at least three families of Diptera, namely, COELOPIDAE, CALLIPHORIDAE and ANTHOMYIIDAE. With the notable exception of *Alysia manducator* (Panz.), very little work seems to have been done on the biology of the ALYSIINAE. It still remains, therefore, to discover how far host-selection is an indication of specific identity.

In trying to discover how many species were represented in the European material which I have studied, I found myself confronted with one of those rather too numerous problems in systematics which tax both patience and powers of observation. The results of this investigation are summed up in the following key.

#### Key to European species of *Aphaereta* (♀♀).

1. Antennae with 24–26 segments, rarely with as few as 23 and then the funicle is pale basally and very slender; at least first 2–3 funicular segments markedly rufescent or yellowish. (Notauli usually well defined) . . . . . 2.  
Antennae exceptionally with as many as 23 segments (large examples of *A. minuta* (Nees)), usually 19–20; only scape and pedicel yellowish or reddish or pale only in part; hence the funicle virtually black throughout. (Notauli virtually absent) . . . . . 3.
2. Outer hairs of middle third of hind tibia clearly shorter than the width of the tibia here; claws (for the genus) not slender (fig. 2, c). (Large, very black species, about 3 mm.; legs deep reddish; wings with a strong brownish-yellow tint, the veins decidedly thick; notauli deeply impressed throughout, crenate) . . . . . *major* (Thomson).
- Outer hairs of the middle third of the hind tibia not at all shorter than the width of the tibia here; claws slender (as in fig. 2, d). (On the whole a smaller species than *major* Thom., about 2.5 mm.; dark brown; notauli often well defined, though apparently never so sharply as in *major*; funicle very slender, its 2nd segment slightly but usually distinctly bent at base and the basal segments considerably paler than the more apical ones; legs predominantly yellowish) . . . . . *venuicornis* sp. n.
3. Larger, stout species, 2.5–2.7 mm. (without ovipositor); legs more hairy . . . . . 4.  
Smaller, slender species, about 2 mm.; legs less hairy. (At least the coxae, trochanters and femora showing a well-marked yellowish tint. ANTHOMYIIDAE on cruciferous plants) . . . . . *difficilis* sp. n.



4. Legs yellowish. (CALLIPHORIDAE in carrion) . . . . . *minuta* (Nees).  
 Legs brownish. (COELOPIDAE in decayed seaweed) . . . . . *minuta* var. *cephalotes* (Hal.).

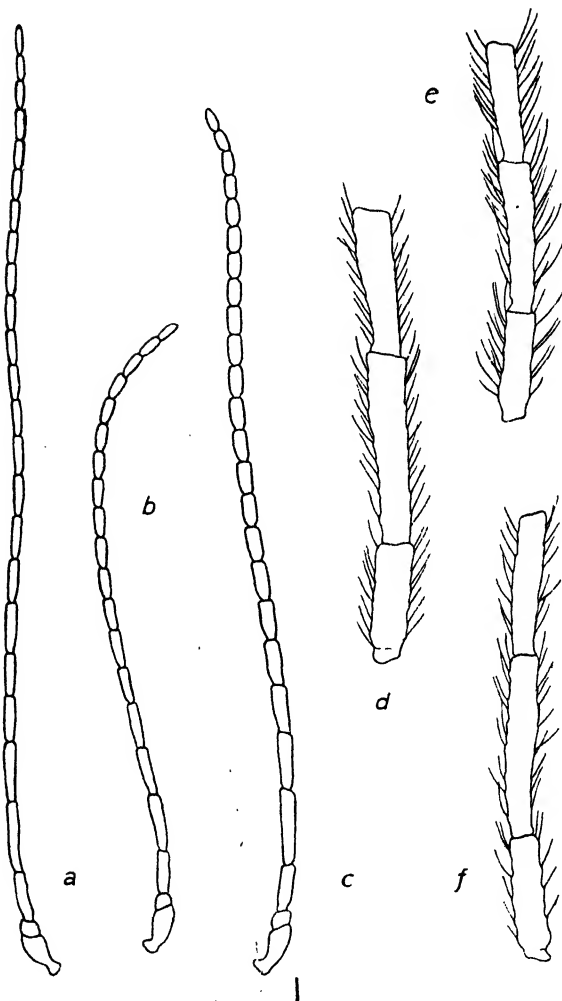


FIG. 1.—a, *Aphaereta tenuicornis* sp. n., antennae of ♀; b, *Aphaereta minuta* var. *cephalotes* (Hal.), antenna of ♀; c, *Aphaereta major* (Thomson), antenna of ♀; d, *Aphaereta major* (Thomson), first three funicular segments of ♀; e, *Aphaereta minuta* var. *cephalotes* (Hal.), first three funicular segments of ♀; f, *Aphaereta tenuicornis* sp. n., first three funicular segments of ♀.

*Aphaereta major* (Thomson).<sup>1</sup>

*Aphaereta cephalotes* (Hal.), Marshall, 1891, var. 1, *Spec. Hym. d'Eur. d'Alg.* 5 : 401.

*Alysia major* Thomson, 1895, *Opusc.* 20 : 2290.

*Aphaereta major* Marshall, 1897, *Spec. Hym. d'Eur. d'Alg.* 5 bis : 242 nec Thomson, (synonymy confirmed).

<sup>1</sup> *A. major* Marshall was described without Marshall knowing of Thomson's *A. major* for the same species.

In addition to the details given in the key, this species, which, incidentally, is the most distinct of all the European species, is further characterised as follows :—

♀. Antennae thick (fig. 1, c, d), becoming submoniliform towards the apex; base of the funicle suffused with dull reddish and of the same colour as the scape and pedicel. Mandibles dark, the middle tooth very narrowly pointed, more so than in the other species; between the upper and middle tooth, there is a distinct cleft (this character may be of doubtful value). Second cubital cell of the fore-wing very strongly narrowed distally, more so than in *A. difficilis* sp. n. (cf. fig. 3, b). Claw of hind tarsus (fig. 2, c).

♂. The antennae may have as many as 28 segments.

ENGLAND : Cornwall, Botusflemming, 1 ♂ (*Bridgman coll.*); Surrey, Byfleet, 1 ♂, 14.v.1932 (*G. Nixon*); Gloucester W., Staunton, 1 ♂, 5.vi.1936 (*E. B. Britton & J. F. Perkins*). IRELAND : Kildare, Sallins, R. Liffey, 2 ♀♀, 17.v.1933 (*A. W. Stelfox*); W. Mayo, Annagh, the Mullet, 1 ♂, 20.vi.1936 (*A. W. S.*); Wicklow, Raheen, 1 ♂, 14.v.1937 (*A. W. S.*). SCOTLAND : Inverness, Aviemore, 3 ♀♀, 1 ♂, 1–11.vi.1934 (*R. B. Benson*); Moray, Grantown, 1 ♀, 8.vi.1934 (*R. B. B.*). SWEDEN (recorded by Thomson).

This appears to be a rare species, though of wide distribution in the British Isles.

### *Aphaereta tenuicornis* sp. n.

I am confident that, under this name, I have gathered together the elements of a species distinct from the others mentioned in this paper. Owing to the lack of material and the great variability in the size of the individuals, I am unable to define the limits of the species with as much accuracy as I should like.

In addition to the characters given in the key, the species may be further diagnosed as follows :—

♂♀. Dark brown. Posterior part of the mesonotum sometimes showing a slight suffusion of red (1 ♂, Nunton, *Bridgman coll.*); legs, on the whole, clear reddish-yellow; in small examples, slightly dingy. Abdomen of the male (Germany) sometimes entirely reddish and contrasting with the darker head and thorax; petiole frequently reddish.

Antennae of the ♀, 23–28-segmented (usually 24–25) (fig. 1, a, f); of the ♂, 25–27; one small male which I refer to this species has only 22 segments; in large individuals of both sexes, the bend at the base of the 2nd funicular segment is characteristic, but in smaller, more fragile-looking individuals, this character is less easily discernible. Claw of hind tarsus (fig. 2, d). Ovipositor sheaths of the ♀ clearly a little longer than the abdomen, both being measured in a lateral view.

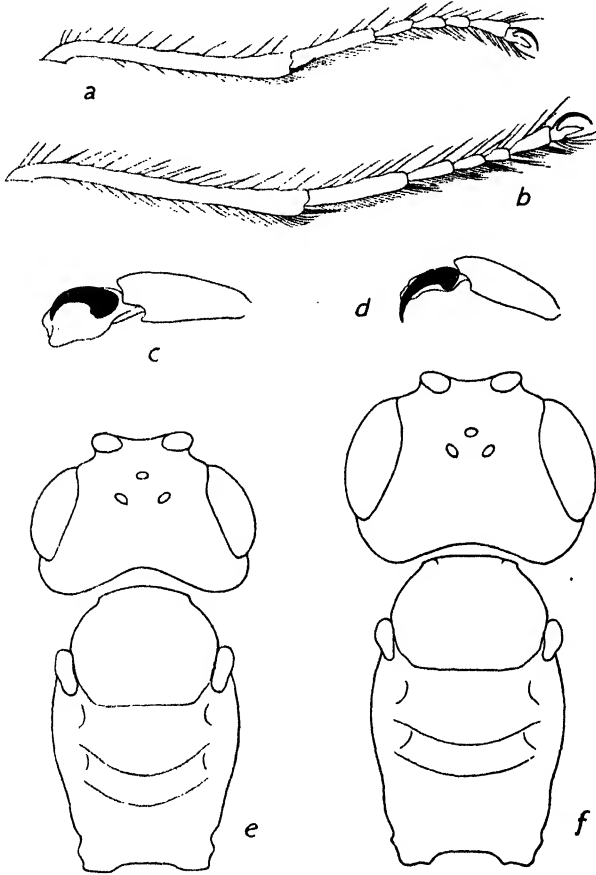
Length : ♂♀, 2.4–2.6 mm. (without ovipositor of ♀).

ENGLAND : Devon, Exmouth, 1 ♀ (*Bignell coll.*); Hants, Brockenhurst, 22–26.viii.1932, 1 ♀; 25–30.vi.1933, 1 ♀ (*G. Nixon*); Surrey, Ashted, 30.viii.1931, 1 ♂; Wisley, 18.vi.1932, 1 ♂ (*G. N.*); Sussex, East Hoathley, 11–19.vi.1932, 1 ♀ (*the type*) (*G. L. Lockley*). GERMANY : 5 ♂♂, 5 ♀♀ (*Ruthe coll.*). IRELAND : taken by A. W. Stelfox as follows : Cavan, Farrinseer, 10.ix.1933, 1 ♂; Kildare, Bryanstown, 4.viii.1937, 2 ♀♀; Leitrim, Tullaghan, 4.vii.1936, 1 ♂; Longford, Castle Forbes, 19.viii.1933, 1 ♂; Wexford, Curraclloe, 23–29.vii.1937, 1 ♂, 3 ♀♀; Wicklow, Glencullen, 28.viii.1935, 1 ♀; Glenmacnass, 17.vi.1932, 1 ♂. Type in the British Museum.

***Aphaereta difficilis* sp. n.**

♂♀. Dark brown; mandibles and propleura paler, reddish-brown. Legs obscure honey-brown, the tarsi darkened. Antennae black with the scape and pedicel same colour as the legs.

♀. *Head*, seen from above, widest at the cheeks and here slightly wider than the width across the eyes; compared with width of thorax (across tegulae) as 14 : 17. Face virtually



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FIG. 2.—a, *Aphaereta difficilis* sp. n., ♀, hind tibia and tarsus; b, *Aphaereta minuta* var. *cephalotes* (Hal.), ♀, hind tibia and tarsus; c, *Aphaereta major* (Thomson), ♀, claw of hind tarsus; d, *Aphaereta tenuicornis* sp. n., ♀, claw of hind tarsus; e, *Phaenocarpa leverii* sp. n., ♀, head and thorax; f, *Phaenocarpa bactrocerae* Gahan, ♀, head and thorax.

smooth, covered with short fine hairs; rest of head smooth, polished and virtually glabrous. Clypeus shining, with only a trace of sculpture. Eyes small, with a very few short, quite inconspicuous hairs. Mandibles with 3 clearly defined teeth, the middle one by far the longest; no trace of a cleft between the upper and middle tooth. Antennae with usually 20 segments (10 ♀♀); in 2 ♀♀, 19-segmented; funicle shining, segments 1 : 2 as 5 : 7; first 4 funicular segments together exactly equal to length of hind tibia. Thorax virtually

glabrous, polished and with hardly a hair. Notauli virtually wanting but indicated anteriorly by short grooves which have lateral direction with perhaps a trace of longitudinal direction. Propodeum with a short basal carina and two longitudinal carinae which fork from it and enclose a narrow subparallel area; costulae present but not well defined; surface posterior to their surface with a few feeble, raised rugosities; dorsal areas of the propodeum, on the whole, smooth and shining. Mesopleura smooth except for the furrow, which has a variable amount of crenulation. Wings: (fig. 3, b). Legs: hairs of outer side of middle third of hind tibia fully as long as the width of the tibia here; claws very slender (fig. 2, a). Abdomen: Petiole slightly longer than wide, irregularly, longitudinally striated; the two usual carinae which originate at the basal corners of the petiole extend close together to apex, and in some individuals tend to be more prominent than the surrounding striae. Ovipositor sheaths a little longer than the length of the hind tibia.

Length: ♂♀, about 2 mm. (without ovipositor of ♀).

Morocco: Fieuzet, 10 ♀♀ (one the type), bred 12 & 20.xii.1937 from *Chortophila brassicae* (Bouché); Rabat, 1 ♂, 2 ♀♀, bred x.1935 from *Paregle radicum* (Linn.) on radish and turnip (*P. Regnier*). Type in the British Museum.

This species is very closely allied to *A. minuta* (Nees) and I have been able to separate the two species only on small differences of degree: smaller size, less robust build and slightly shorter, slightly sparser vestiture of the legs and antennae seem to provide the only morphological justification for regarding *A. difficilis* as distinct from *A. minuta*. On the other hand, when these differences are taken in conjunction with the rather wide dissimilarity in habits, there seems to be better reason for at least a provisional separation.

### *Aphaereta minuta* (Nees).

*Stephanus minutus* Nees, 1811, *Berl. Mag.* 5: 5 (no. 3, ♂).

*Alysia cephalotes* Haliday, 1833, *Ent. Mag.* 1: 265.

*Alysia fuscipes* Nees, 1834, *Ichneum. Aff.* 1: 254.

The above synonymy is in accordance with that given by Marshall, though, for reasons not stated, he used the name *cephalotes* Hal., instead of *minuta* Nees for the species in question. In establishing this synonymy, Marshall evidently did not take into account the range of habit developed within the genus, and at the time of writing his monograph on the British BRACONIDAE believed that only one species of *Aphaereta* occurred in Britain. Nees himself sunk his own *Stephanus minutus* under his *Alysia fuscipes*, suppressing the earlier name *minutus* because he had described actually within *Alysia* a species which he called *minuta*. Both these Neesian names referred to forms of *Aphaereta* taken inland and their types are known to be lost.

Haliday's *Alysia cephalotes* is clearly not a homogeneous segregate, though it seems probable that he intended the name chiefly for the maritime form which occurs in decayed seaweed.

In order to be consistent with Marshall's synonymy, for he was first reviser, and at the same time to emphasise the difference in biology, I am restricting the name *minuta* to the form of *Aphaereta* parasitising carrion-infesting Diptera, and am calling the form which occurs in the seaweed "*Aphaereta minuta* var. *cephalotes* (Hal.)." Both forms are so alike that I am able to separate them only on trifling differences of colour and then only in a part of the specimens.

ENGLAND: Cambridge, 7 ♀♀, 1 ♂, bred from *Calliphora erythrocephala* Mg. (*Graham Smith*); FRANCE: Lyon-Les Massues, 12 ♀♀, 4 ♂♂, bred 27.viii.1917

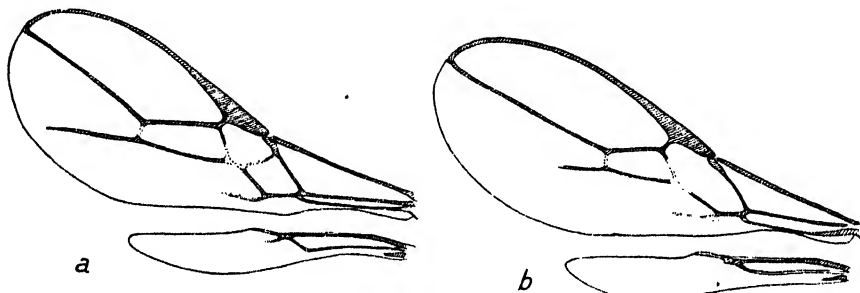
from the carcase of a small mammal (*P. Riel*); GERMANY : 12 ♀♀ (*Ruthe coll.*) (these females are referred only provisionally to *A. minuta* (Nees)).

Evans (1933) has bred this species from two genera of carrion-infesting Diptera : *Calliphora* and *Lucilia*. According to him, the parasite is gregarious, the female laying from ten to fifteen eggs in a host-larva.

In the Bignell collection is a card of 5 females, which Bignell says were bred from excrement. I can find no difference between them and typical females from carrion.

*Aphaereta minuta* var. *cephalotes* (Hal.).

This is the common form of *Aphaereta* found amongst decaying seaweed on the sea-shore of the coasts of Britain. The only record of its having been bred is as follows : Dorset, Osmington, 2 ♀♀ bred 19.x.1912 (pupae of host found 22.ix.1912) from the dipteran *Orygma luctuosum* Meig. (see 1916, *Ent. mon. Mag.* 52 : 206). Lyle does not state whether the parasites were bred singly or together.



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FIG. 3.—Wings of : a, *Phaenocarpa leverii* sp. n., ♀; b, *Aphaereta difficilis* sp. n., ♀.

Although I can find no structural difference between this form and typical *A. minuta* (Nees) from carrion, I am retaining for it Haliday's name "*cephalotes*" in order to emphasise the difference in breeding habits. It is possible that a more exhaustive examination of the two forms may reveal differences which I have been unable to detect; this is all the more likely since those characters which I have already recognised as valid for separating species are slight and not easy to appreciate. Antennae (fig. 1, b, e). Hind tibia and tarsus (fig. 2, b).

*Phaenocarpa* Förster.

*Phaenocarpa leverii* sp. n.

♂♀. Brown, suffused with paler colouring, light rufous, especially on cheeks, pronotum, propleura and sometimes mesonotum. Mandibles and clypeus pale like the paler parts of the body. Antennae : first 5 or 6 segments yellow-testaceous, then darkening to brown; apical 6 or 7 segments white; in the one male available, the apical segments of the antennae are not contrasting white, the last 2 or 3 segments appearing merely somewhat greyish. Legs pale honey-yellow; coxae and trochanters sometimes showing a whitish tint. The vertex is divided by a dark, subintegumentary line extending from the ocellar region to the occiput; owing to the dark colour of the head, this line is not conspicuous as in *P. bactrocerae* Gahan.

♀. *Head* not much wider than the greatest width of the thorax (fig. 2, e). Face completely smooth, covered with short, more or less erect hairs; rest of head polished and virtually glabrous. Mandibles with 3 clearly defined teeth, the upper one the largest, truncate at apex; the middle one the longest, narrowly triangular. Clypeus transverse, 3-4 times as wide as long. Antennae 23-segmented (2 ♀♀); in *P. bactrocerae* Gahan, 26-segmented; funicle very shining, clothed with semi-erect hairs which are slightly longer than the width of the segments; funicle 1 to 2 as 5 : 8. *Thorax* (fig. 2, e) : Mesonotum smooth, polished; a short, linear fovea posteriorly. Notauli wanting, their imaginary course marked by a row of short, well-spaced hairs. Propodeum with a short, basal carina which forks into two fine carinae; these latter carinae enclose a narrow, subparallel-sided area, which extends over about two-thirds the middle length of the propodeum; no costulae present; surface otherwise, polished. Mesopleura smooth except for the feebly crenate furrow. Wings : (fig. 3, a) stigma of fore-wing merging gradually into the metacarp; hence point of emission of radius in relation to length of stigma not definable but clearly a little nearer to base than in *P. bactrocerae* Gahan; submedian cell of the hind-wing not complete. Legs somewhat thick, clothed with short, bristle-like hairs which are a somewhat conspicuous feature of the tarsi; claws long, very slender, slightly longer in proportion to the length of the apical tarsal segment than in *P. bactrocerae* Gahan. *Abdomen* : Petiole only very slightly shorter than its apical width on actual measurement, though appearing longer (in the ♀ paratype of *P. bactrocerae* Gahan compared, the petiole is longer, about 7 : 5); the two carinae converge to a point near the apical margin; they are not much raised, less so than in *P. bactrocerae* Gahan, and the surface between them is feebly rugose; the surface lateral to the carinae virtually smooth. Full length of ovipositor equal to  $1\frac{1}{2}$  times the length of the hind tibia; the merest trace of notch before apex; sheaths about two-thirds as long as the abdomen, clothed with long, not close, bristles.

♂. Antennae with 27 segments (1 ex.).

Length : ♂♀, 1.8 mm., approx. (including ovipositor of female).

FIJI Is. : Colo-i-Suva, 3 ♀♀ (one the type), 1 ♂, bred 23.iii.1938 from *Chaetodacus passiflorae* (Frogg.) (*R. A. Lever*).

Through the kindness of the authorities of the United States National Museum and especially of Dr. C. F. W. Muesebeck of the United States Bureau of Entomology, I have been able to examine a paratype female of *Phaenocarpa* (*Asobara*) *bactrocerae* Gahan. This species clearly belongs to the same species-group as *P. leveri* sp. n., in my opinion, and is closely related to it. The most obvious structural differences between the two species are the shape of the head and its width in comparison with that of the thorax (fig. 2, f) and the length of the ovipositor; the latter is much shorter in Gahan's species; its sheaths are more irregular in outline, somewhat expanded before the apex and beset with longer bristles. To the naked eye, *P. bactrocerae* Gahan is yellowish-red while *P. leveri* sp. n. has a dark brown appearance.

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# SOME AFRICAN SPHAEROCERIDAE (BORBORIDAE) IN THE COLLECTION OF THE BRITISH MUSEUM (DIPTERA)

By O. W. RICHARDS, F.R.E.S.

OWING to the kindness of Miss D. Aubertin (Mrs. Dinely) and later of Dr. J. Smart of the Department of Entomology, British Museum (Natural History), I have lately had the opportunity of examining all the unidentified African Sphaerocerid flies in the Museum collection. These are recorded and where necessary described in the following paper.

*Leptocera* Olivier, 1813.

Subgenus *Leptocera* s.s.

*Leptocera curvinervis* (Stenhammar, 1854).

CAPE PROVINCE 7 ♀♀, 2 ♂♂ (*R. E. Turner*): Mossel Bay, v.1932, Worcester, i.1934, Somerset East, xi.1930 and i.1931, Swellendam, i.1933; NATAL: Weenen, 1 ♀, v.1934 (*H. P. Thomasset*).

This species has already been recorded by Duda (1925: 50) from Europe, Java, New Guinea, Ceylon and various parts of Africa.

*Leptocera kovácsi* (Duda, 1925).

ABYSSINIA: Djem-Djem Forest, c. 8000 ft., 1 ♂ (probably this species) 23.iv.1926 (*Hugh Scott*). Duda (1925: 56) described this species from Abyssinia and the above male agrees closely with the original description.

Subgenus *Rachispoda* Lioy, 1864.

*Leptocera acrosticalis* (Becker, 1903).

BECHUANALAND: Mafeking, 1 ♀, 27.ii.1934 (*J. Ogilvie*). Duda (1925: 46) describes a number of forms with different types of male genitalia which he groups under the above name. The female in the British Museum collection corresponds to one of these males.

*Leptocera scottii* sp. n.

Male. Dull greyish-black, trochanters lighter, halteres pale yellow, wings a little brown-tinged. Length 2 mm.

Strong jowlar bristle more than half as long as vibrissa; facial "knob" little developed; arista nearly three times as long as antenna with rather long pubescence; three pairs of rather weak interfrontal bristles. Mesonotum with 2 + 3 pairs of dorsocentrals, the anterior pair convergent, a pair of strong acrostichals (separated by microchaetes) in front of suture, and one acrostichal just behind it; scutellum a little longer than broad, surface, except at base and down central line, covered with short bristles, margin with three pairs of strong bristles, with a further subapical pair shorter than the others (about half as long as the apicals) and on each side two very minute bristles, one at base and one (not quite on margin) between first and second strong bristles; sternopleuron with one very strong bristle and a smaller one in front of it. Wing with second costal sector more than twice as long as third,  $R_{4+5}$  rather strongly bent, posterior outer corner of cell angulated. Mid femur with a short, stout, thorn-like bristle ventrally at base (about one-third as long as diameter of femur); mid tibia in basal third dorsally with a pair of small bristles and below them two

stronger bristles which are nearly paired, just below the mid point of tibia with three strong bristles (central one the biggest) with two small ones above them, ventrally tibia with no bristles but at apex with rather dense pubescence including a thorn-like projection like that on femur; basitarsus a little shorter than the second segment, with a long ventral bristle. Hind tibia with short dorsal, bristle-like pubescence; second tarsal segment not thickened, twice as long as first. Abdomen dull grey, after first tergal plate (= I + II), tergites short and of diminishing length, only fourth and fifth with a long lateral bristle; genitalia rather large, anus small and narrow, pubescence longer below, but nowhere very conspicuous; outer forceps somewhat dorso-ventrally enlarged, produced below into short, black, backwardly directed hooks, aedeagus visible as a long, slightly curved, median rod (longer than third segment of hind tarsi); fifth sternite at apex thickened and emarginate, with short woolly pubescence.

Type ♂ ABYSSINIA: Mt. Chillálo, moorland c. 12000–13000 ft., 21.ix.1926 (*Hugh Scott*).

This species runs down to *L. acrosticalis* (Becker) in Duda's key, but differs in having more numerous scutellar marginal bristles, modified mid tibiae and femora, and different genitalia.

Subgenus *Opacifrons* Duda, 1918.

*Leptocera coxata* (Stenhammar, 1854).

ABYSSINIA: Djem-Djem Forest, from river bed, c. 8000 ft., ♂, 2.x.1926 (*Hugh Scott*).

A widespread species already recorded from Abyssinia by Duda (1925: 70).

Subgenus *Chaetopodella* Duda, 1920.

*Leptocera cursoni* sp. n.

Female. Dull velvety-black; jowls, face and small transverse area above antennae dirty yellow-brown; thoracic pleuron dull grey-brown, legs brown, wings milk-white, halteres yellow; abdominal sterna largely yellow-brown; larger bristles of head and thorax all rising from small grey spots. Length 1.5–1.75 mm.

Head on each side with one rather short vibrissa and one jowlar bristle about half as long; facial "knob" small, very little prominent; antennae divergent, third segment pyriform, arista about four times as long as antennae with rather short pubescence; head bristles normal, about three pairs of interfrontals decreasing in size forwards, anterior of the two outward and backward curving superior orbitals half the size of the other, which is a little smaller than the inward and backward curving one; grey marks at bases of bristles fusing to form narrow grey lines along orbits and interfrontals. One strong, one moderate and one weak humeral bristle, behind the suture three pairs of rather strong dorsocentrals, acrostichals somewhat widely spaced, between the dorsocentrals four rows in front and two behind; sternopleuron with one rather strong bristle and one weak one anteriorly; scutellum as long as broad, with four bristles, apical pair more than twice as long as scutellum. Wings with veins hyaline, first sector of costa with a pair of rather long bristles at base, beyond this also with rather longer bristly hairs than usual, second sector one and two-thirds times as long as third, costa not produced beyond  $R_{4+5}$ , ending well before wing-tip;  $R_{2+3}$  nearly straight, distal part very little curved on to costa;  $R_{4+5}$  with base of last section straight, distal part rather strongly curved on to costa; cell rather narrow,  $M_{1+2}$  produced as a hyaline vein almost to margin,  $M_{3+4}$  hardly produced beyond cell, cross-vein *im* short, less than half as long as distance along  $M_{1+2}$  to cross-vein *r*; rudimentary anal vein regularly diverging from  $M_{3+4}$ ; alula rather large and rounded. Fore



femora with three or four long postero-dorsal bristles on apical half; fore tibia without bristles; fore tarsi considerably longer than tibia, basitarsus nearly as long as next three segments together. Mid trochanter with a rather long bristle lying along the femur; mid femora with complete row of short, stout, antero-dorsal bristles and, at apex, a posterior bristle; mid tibiae dorsally with a pair of small bristles at  $\frac{1}{4}$ , just below them another pair of which the anterior bristle is large, twice as big as posterior one (which is set a little lower), tibia at  $\frac{3}{4}$  with a pair of large bristles, the anterior one surmounted by a small one, ventrally with a median and an apical bristle, at apex with a moderately long anterior and posterior bristle; mid tarsi fully one and a half times as long as the tibia, basitarsus as long as the next three segments together, with a long median ventral bristle and four moderately long apical bristles. Hind femora without bristles except an anterior one at apex; hind tibiae without bristles but with rather sparse outstanding pubescence nearly as long as the diameter of tibia; hind tarsi with second segment not thickened, more than twice as long as first. Abdomen with all tergites with long bristles at sides, genito-anal cavity transverse, closed above by a small plate bearing short hairs and two long woolly ones; first sternal plate (= I + II) large and dark, remainder of sternites and the broad lateral connecting membrane bright yellow, the sternites with short black bristles.

Male. Mid tibiae a little curved over apical third, with or without mid ventral bristles (2 with, 3 without); genitalia small, with a pair of long bristles on each side of the sub-circular anal cavity; outer forceps not clearly visible, but in ventral view widely separated.

Type ♀ ZULULAND : Nagana Res. Lab., from drinking place of cattle, 8.vi.1922 (*H. H. Curson*). Allotype ♂ and 3 ♂♂, 8 ♀♀ paratypes with the same data; further paratypes ZULULAND : Umfolosi R., on dung of Rhino, 1 ♂, 1 ♀, vi.1922 (*H. H. Curson*). In Duda's key (1925 : 145) this species runs down to *L. (C.) pulchripes* Duda, 1925 of Paraguay, but that species has white hind tarsi, the anterior superior orbitals of equal size and the distal part of  $R_{4+5}$  nearly straight.

Subgenus *Poecilomella* Duda, 1925.

*Leptocera longecostata* Duda, 1925.

ABYSSINIA : Djem-Djem Forest, 8000-9000 ft., 1 ♂, 3 ♀♀, 21.ix. to 1.x.1926 (*Hugh Scott and J. Omer Cooper*); East Cape Province, Katberg, 4000 ft., 1 ♂, 1 ♀, xi.1932 (*R. E. Turner*).

The species was previously recorded by Duda (1925 : 92) from Abyssinia, S. Nigeria, E. Africa, S. Kamerun, and Togo.

*L. pallidimana* Duda, 1925.

Cape Province, Somerset East, 1 ♂, 2 ♀♀, xi.-xii.1930 (*R. E. Turner*). Previously recorded by Duda (1925 : 85) from a single male captured in Abyssinia. The female resembles the male in all respects; seventh tergite with a central keel; cerci each with two woolly hairs.

*L. angulata* (Thomson, 1868).

S. AFRICA : French Hoek, 40 m. from Cape Town, 1 ♂, xi.-xii.1930 (*H. W. Simmonds*); CAPE PROVINCE : Mossel Bay, 1 ♂, vi.-vii.1930 (*R. E. Turner*); ABYSSINIA : Djem-Djem Forest, 8000-9000 ft., 1 ♀, 21-29.ix.1926 (*Hugh Scott*); ABYSSINIA : Djem-Djem Forest, nearly 9000 ft., 1 ♀, 1.x.1926 (*Hugh Scott*). The last recorded female is somewhat abnormal. The mesonotum instead of being black is dark, bronzy-brown with light silvery-grey spots, partly outlined

with dark brown. In other characters it agrees with the males. The other female is immature, but it would probably be more like the males when mature.

The species has been recorded by Duda (1925 : 93) from Cuba, Colombia, Brazil, Paraguay, Peru, Madagascar, Abyssinia and E. Africa.

Subgenus *Limosina* Macquart, 1835.

*Leptocera mediospinosa* Duda, 1925.

CAPE PROVINCE : Somerset East, 1 ♂, x.1930 (*R. E. Turner*); EAST CAPE PROVINCE, Katberg, 4000 ft., 1 ♂, x.1932 (*R. E. Turner*). The species has previously been recorded by Duda (1925 : 182) from Transvaal and Chile:

*Copromyza* Fallén, 1820.

Subgenus *Gymnometopina* Hedicke, 1923 (= *Gymnometopa* Duda *nec* Coquillett).

*C. clunicus* Duda, 1923.

NATAL : Weenen, 1 ♂, vi.-ix.1927 (*H. P. Thomasset*). Previously recorded by Duda from Madagascar, E. Africa (Kilima-Njaro) and Abyssinia.

Subgenus *Borborillus* Duda, 1923.

**C. sordida** Zetterstedt, 1847 var. **hypopygialis** var. n.

Duda (1933) has already described, from Abyssinia and E. India, a variety *tropicus* of this species. He differentiated the variety by means of slight differences in colour and hairiness. The form described below seems to be rather similar to Duda's variety, but there is a marked difference in the form of the male genitalia, which is not referred to in his description. For the present, therefore, I must describe it as distinct. The females, as far as I can see, are identical with European specimens.

Exactly like *C. sordida* Zett. as described by Duda (1923) but male genitalia a little different : outer forceps triangular, not narrowed at tip, dull with a very short black tip (in *C. sordida* Zett. narrowed suddenly just before tip and produced into a shining black, parallel-sided process); another pair of finger-shaped processes curve backwards (*i.e.* dorsally) and are shining black (in *C. sordida* Zett. these processes are shorter and broader and dull grey); a third triangular process is foot-shaped, shining brown and curves forwards (*i.e.* ventrally) (in *C. sordida* Zett. the corresponding process is shorter and blunter).

Type ♂ ZULULAND : Umfolosi R., vi.1922 from Rhino dung (*H. H. Curson*). 6 ♂♂, 10 ♀♀ with the same data.

Subgenus **Femoromyza** subgen. n.

No long jowlar bristle. A pair of small convergent postvertical bristles. No post-ocular bristles near eye, those that are present being more ventral (posterior). Mesonotum without tomentum and almost without microchaetes. Scutellum with four moderately strong marginal bristles only. No sternopleural bristles. Mid tibia with no row of numerous dorsal bristles. Hind femur thickened and spiny. Hind tibia curved, without an antero-ventral bristle and with no apical ventral spur.

Differs from all other subgenera in the thickened hind femora and in the combination of having four scutellar bristles but no hind tibial spur.

Genotype *Copromyza rhinocerotis* sp. n.

**Copromyza (Femoromyza) rhinocerotis sp. n.**

Male. Strongly shining black; antennae yellow-brown (in the paratype male and allotype female the vertex becomes yellow-brown on front half); hind coxae yellow; junction of all femora and tibiae, basal fifth of fore tibia, all tarsi, brown; halteres whitish-yellow; wings hyaline. Length 2 mm.

Head with mouth-parts normal, praelabrum rather large; vibrissa long, arising from frontal suture at a point distinctly removed from oral margin; jowls bare except for very short hairs along the oral margin, as broad in front as third antennal segment, very broad behind, lower edge with a distinct raised margin, postero-ventral angle completely rounded; eyes rather small, elongate-oval, long diameter about one and a half times as long as the short one, outline not emarginate; face deeply sunk in, with lower edge of epistoma considerably reflexed, upper part almost forming a cavity to contain the antennae, cavity not divided by a keel, facial "knob" not developed; antennae short, nearly parallel, third segment oval, long axis vertical, arista dorsal, three times as long as the antenna, with very short pubescence; vertex strongly shining, central triangle only feebly defined, very narrow (in centre not as wide as third antennal segment), reaching anteriorly to frontal suture; two pairs of small interfrontals arising a little from edge of middle of central triangle; further bristles on each side are—three superior orbitals, two weak, anterior outwardly directed ones and one stronger inwardly directed one behind—a small ocellar, a small convergent postvertical; postoculars very minute and only found at back of dorsal part of occiput, not near eyes. Mesonotum as broad as head with eyes, subquadrate with rounded angles, convexity and sutures normal; on each side with one weak, one moderate, recurved humeral, one moderate notopleural, two supra-alars (the posterior one strong), one moderate presutural interalar, three dorsocentrals (one in front of scutellum, one just behind suture and one well in front of it), one minute acrostichal between the posterior dorsocentrals; surface without tomentum and without microchaetes except for one in front of each presutural dorsocentral and two on each humeral callus; scutellum about one and a half times as broad as long, subtriangular, with a pair of basal and a pair of apical, moderately long bristles, otherwise bare; mesopleuron strongly shining throughout, without bristles. Fore femora a little thickened, with two dorsal bristles near base, all other bristles confused with the general, semi-erect, moderately long pubescence; fore tibia not thickened, without bristles; fore tarsi as long as tibia, not flattened, basitarsus produced into a small hook ventrally at apex. Mid femur not at all thickened, without bristles; mid tibia with a small antero-ventral bristle at  $\frac{2}{3}$  and a ring of small bristles at apex; mid tarsi with first three segments together as long as tibia, basitarsus a little shorter than the next two segments together. Hind femur strongly thickened (three times as thick as mid femur, twice as thick as fore femur), thickest at middle, beneath with two rows of strong spines, the spines of the anterior row starting near base where they are short and widely spaced, of the posterior row starting near middle, both rows becoming long and much more closely placed just before apex—where there are also numerous close very short spines; femur dorsally with only rather short pubescence; hind tibia curved through a right angle at base and weakly curved throughout, with only short pubescence and without an apical ventral spur; hind tarsus without special features, basitarsus with a short ventral bristle at apex, second segment little thickened, one and a half times as long as basitarsus. Wings of the usual *Copromyza* type, costa with a pair of bristles near base, the dorsal one more than twice as long as the ventral one, costa ending at a point a little beyond  $R_{4+5}$ , last section between  $\frac{1}{2}$  and  $\frac{1}{4}$  the penultimate;  $R_{2+3}$  nearly straight, moderately bent on to costa at apex;  $R_{4+5}$  distinctly curved forwards over its apical quarter; last section of  $M_{1+2}$  hardly longer than penultimate, parallel to  $R_{4+5}$ ; outer posterior angle of cell almost rounded, lying very close to wing-margin,  $M_{3+4}$  hardly produced beyond the cell; anal cell extending a little beyond the posterior basal cell; alula long and narrow with a pale fringe. Abdomen

with tergites bare, with bristles only at edges of tergites, surface moderately shining, weakly alutaceous, tergites with a preopical impressed line, one long bristle at sides of segments III, IV and V; first tergal plate (I + II) not very much narrowed anteriorly, not quite twice as broad posteriorly as median length, tergites III and IV subequal and half as long; tergite V not quite as long as II and III together; sixth tergite nowhere visible; first sternal plate (I + II) short, three others subequal and moderately long, smooth and shining with rather sparse pubescence, nearly as broad as the tergites, posterior margin of sternite 5 quite straight and unmodified, bearing about six long bristles; genitalia small with 6-8 outstanding bristles, anal opening circular.

Female. Fore basitarsus without a hook. Hind legs (perhaps as a result of being free from gum) with the femur bearing rows of moderately long ventral and dorsal bristles; hind tibia also with a double dorsal row of outstanding hairs which are a little longer than the diameter of the tibia. Abdomen apparently normal, with all the segments sclerotised but becoming narrow posteriorly; cerci bearing some rather short, woolly pubescence.

Type ♂ ZULULAND: Umfolosi, vi.1922 "from dung of rhino" (H. H. Curson); paratype ♂ and allotype ♀ with the same data.

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### THYSANOPTEROLOGICA (VIII)

Von Dr. H. PRIESNER.

Communicated by Dr. O. W. RICHARDS, F.R.E.S.

#### *Xylaplothrips ulmi* sp. n.

♀ (f. brachyptera): Graubraun, rotes Pigment in kleine Flecke aufgelöst im Thorax und Abdomen; Vordertibien zum Grossteil hellgelb, bei dunklen Stücken vielleicht am Aussenrande getrübt, Mittel- und Hintertibien blass graugelb, gegen das Ende lichter, alle Tarsen hellgelb; 1. und 2. Fühlerglied gelbgrau, das 1. am Grunde der Quere nach etwas lichter, das 2. am Ende aufgehellte, 4.-8. Glied einfarbig dunkelgrau, das 3. Glied am lichtesten, aber nicht rein hellgelb, sondern etwa von der Mitte ab unscharf abgegrenzt leicht getrübt.

Kopf seitlich deutlich gewölbt, nach vorn an den Augen etwas stärker verengt als nach hinten; Augen verhältnismässig klein, 39-43  $\mu$  lang, bei einer Wangenlänge von 102-106  $\mu$ ; Kopflänge 146 (samt IAF. 160)  $\mu$  Breite an den Augen 116, in der Mitte 128  $\mu$ ; die Ocellen liegen in sehr niedrigem Dreieck, sind mässig gross, innerer Abstand der hinteren 37  $\mu$ ; Microsetae stehen 1 an den Seiten des vorderen Ocellus, 1 vor und 1 hinter dem hinteren Ocellus, eine weitere dahinter, aber noch innerhalb der Augen; Postokularborsten lang (sicher über 43  $\mu$ ), farblos, sehr dünn, praktisch spitzig; sie liegen ziemlich weit nach aussen an den Schläfen und sind voneinander etwa 100  $\mu$  entfernt; Mundkegel stark abgerundet, kräftig, Oberlippe stumpf; 2. Maxillarpalpenglied 32-34  $\mu$  lang, 7  $\mu$  breit; Fühler 303  $\mu$  lang; Gliederlängen (-breiten): 24 (B. 29, Sp. 22), 45 (27), 38-39 (25), 41 (26), 42-42 (22), 38 (22), 42 (19), 27 (13)  $\mu$ ; 1. Glied aussen etwas konkav, 2. normal, 3. stark konisch, am Grunde dünn, 6. am Grunde dünn, spindelförmig, 8. an das 7. breit anschliessend, ziemlich spindelförmig, 8. regelmässig konisch; 3.-7. Glied mit je zwei dünnen,

spitzen, mässig grossen Sinneskegeln, am 6. ist der äussere schon haarartig. Prothorax wie bei den anderen Arten dieser Gattung mit sehr gut entwickelten Vordereckenborsten, während die inneren rudimentär sind; diese Borsten sind licht, schätzungsweise etwa 28  $\mu$  lang und erscheinen spitzig; äussere Hintereckenborsten hell, dünn, lang (71–79  $\mu$ ), am Ende schmal abgerundet. Pronotum lang, 150–155  $\mu$ , hinten bogig, samt Coxen 215  $\mu$ , ohne diese 182  $\mu$  breit. Vorderschenkel einfach, nicht verdickt, an den Vordertarsen ist die Klaue sehr deutlich, ein Zähnnchen vermag ich nicht zu erkennen, es ist aber möglich, das ein sehr kleines solches vorhanden ist. Pterothorax 190  $\mu$  breit, schmaler als der Prothorax, Flügel verkümmert. Die Abdominalsegmente sind bei dem einzigen Exemplar eingezogen; Borsten an den Seiten lang und sehr dünn, haarartig scharfspitzig, am 8. Segment 83–87  $\mu$ , am 9. Segment, B. 1: 130  $\mu$  (oder mehr), B. 2 genau 154–158  $\mu$  lang, haardünn. Tubus dorsal 91, lateral 95  $\mu$  lang, am Grunde 55, am Ende 29  $\mu$  breit, im Ganzen konisch, aber im basalen Drittel doch ganz leicht geschnürt; die lateralen Analborsten (B. 2 (4)) etwa 235  $\mu$  lang.

Fundort: UNGARN: Simontornya, 1 ♀ (Holotype in meiner Sammlung), 21.iii.1924, unter *Ulmus*-Rinde (leg. F. v. Pillich).

Seit 1924 hatte ich dieses Exemplar zurückgestellt, hauptsächlich deshalb, weil das Tarsenzähnnchen nicht deutlich zu sehen ist. Ich bin aber heute davon überzeugt, dass es in jene schwer zu definierende Uebergangsgruppe zwischen *Haplothrips* und *Hoplothrips* gehört, die von den Amerikanischen Kollegen früher als *Zygothrips* bezeichnet wurde; der Typus der Gattung *Zygothrips* Uzel ist hingegen ein echter *Haplothrips* der *subtilissimus*-Gruppe, der nur durch den kurzen Kopf und den Mangel der Sinneskegel am 3. Fühlerglied, ferner die Färbung ausgezeichnet ist. In Europa ist eine Form (*Haplothrips fuliginosus* Sch.) häufig, die ich wegen des symmetrischen 3. Fühlergliedes, den Besitz von nur 2 Sinneskegeln am 4. Glied und wegen des *Hoplothrips*-artigen Habitus unter dem Namen *Xylaplothrips* (als Subgenus von *Haplothrips*) abgetrennt hatte. Ich finde aber, dass diese Form eigentlich der Gattung *Karnyothrips* näher steht; das Tarsenzähnnchen, obwohl kleiner als bei *K. flavipes* (Jones), dem Typus der Gattung *Karnyothrips* Wats. (da *K. weigeli* Wats. = *Anthothrips flavipes* Jones), ist ebenso schräg nach vor gerichtet, wie es für *Karnyothrips* charakteristisch ist (s. Hood, 1927, *Pan Pac. Ent.* 3: 175–178, fig. 1). *Xylaplothrips* kann von *Karnyothrips* nur durch die schwachen Schenkel und das kleine oder verkümmerte Tarsenzähnnchen unterschieden werden, im Habitus stehen diese beiden Gruppen einander aber näher als *Haplothrips* s.str.

Zu *Karnyothrips* gehören sicher die folgenden Arten: *K. flavipes* (Jones), typ. gen.; *K. cameroni* Pr.; *K. dodgei* (Hood); *K. melaleucus* (Bagn.); *K. ochropezus* Hood; *K. rhopalocerus* (Hood); *K. ripicola* (Pries.) (= *Trichothrips ripicola* Pr.). *Cephalothrips errans* Moul. ist ein Synonym von *K. flavipes* (Jones). Ueber die Arten *K. fuscipennis* Mlt. und *K. nigriflavus* Ram. vermag ich vorläufig nicht zu urteilen.

Zu *Xylaplothrips* gehören: *X. fuliginosus* (Schille), typ. gen.; *X. americanus* (Hood) (früher *Zygothrips*); *X. fungicola* (Pr.) (früher *Haplothrips*); *X. harti* (Hood) (früher *Zygothrips*); *X. subterraneus* Pr.; *X. ulmi* sp. n.

Die neue Art, *ulmi*, kommt dem *americanus* Hood (den ich durch Herrn Dr. Floyd Andre (Washington) erhielt) am nächsten und ist ihm in der Färbung, Fühlerbildung und durch die langen Borsten am Abdomen sehr ähnlich. Die Analborsten sind aber bei *ulmi* noch länger, die Borsten am Kopf und Pronotum sind spitzig oder fast so und die beiden miteinander vereinigten Fühlerendglieder sind deutlich länger als bei *americanus*. Von *fuliginosus*

unterscheidet sich *ulmi* leicht durch die viel geringere Grösse, die viel längeren Borsten am Abdomenende, die verschiedene Fühlerfärbung und besonders das am Ende mit dem 7. breit vereinigte 8. Glied, das bei *fuliginosus* an der Basis deutlich schmaler ist als das 7. an der Spitze. Die anderen Arten sind nicht zu verwechseln.

### **Scotothrips** nom. n.<sup>1</sup>

(*Adiaphorothrips* auctt. nec Bagnall.)

Körper mächtig. Kopf viel länger als breit und viel länger als der Prothorax, vorn nicht vorgezogen, nach hinten verengt. Wangen mit Dörnchen besetzt. Augen mässig gross. Fühler 8-gliedrig, die mittleren Glieder lang, die distalen unten ohne Fortsatz. Scheitel mit 1 Paar sehr langen (und 1 Paar kurzen) Postocularborsten, alle anderen dorsalen Kopfborsten klein. Pronotum vorn stark gebuchtet, seine Borsten lang, auch die der Vorderecken, die inneren anteromarginalen klein bis mässig lang. Vorderschenkel beim ♀ etwas beim ♂ stark verdickt, wie die Tibien ohne Zahnbildungen, aber die Vordertarsen bei beiden Geschlechtern mit Zahn der beim ♀ dreieckig ist. Flügel gleichbreit, leicht gebogen, zum Ende etwas erweitert, mit zahlreichen Schaltwimpern. Borsten am Abdomen lang. Tubus ungefähr von Kopfeslänge, regelmässig konisch.

Typus generis: *Adiaphorothrips elephas* Karny.

*Adiaphorothrips simplex* Bagn., der Typus dieser Gattung, ist das ♂ einer *Machatothrips*-Art, wie ich mich durch die Untersuchung der Type überzeugen konnte; so ist *Adiaphorothrips* ein Synonym von *Machatothrips*; es musste also für die unter dem Namen *Adiaphorothrips* beschriebenen anderen Arten ein neuer Name geschaffen werden.

Zur Gattung *Scotothrips*, wie sie eben von mir charakterisiert wurde, gehört sicher noch die Art *differens* Pr. Ob alle anderen Arten hierher oder zu *Diceratothrips* oder anderswohin gehören, muss die nähere Untersuchung derselben lehren.

### *Chirothripoides* Bagnall.

Diese Gattung gehört zu den Phlaeothripiden und kann m.E. nicht als besondere Familie gelten. Die Gattung hat in der Gruppe der Plectrothripini zu stehen, da sie alle wesentlichen Merkmale dieser ziemlich scharf abgegrenzten Gruppe aufweist. Sie kommt *Mastigothrips* Pr. am nächsten.

### *Cnestrothrips* Pries.

Die Gattung *Cnestrothrips* ist von mir bisher nur in meiner Uebersicht über die die *Machatothrips*-Arten kurz erwähnt worden (1932, *Rev. zool. bot. Afr.* 22 : 344). Sie ist im folgenden näher behandelt.

Fühler 8-gliedrig, Glieder lang, 8. am Grunde etwas geschnürt. Mundkegel lang, am Ende schmal abgerundet. Kopf länger als breit, länger als der Prothorax, Wangen mit starken, dunklen Dornen besetzt. Vor dem hinteren Ocellus ein Paar deutliche Borsten; 1 Paar Postocularborsten; Kopf- und Pronotum-Borsten lang, am Ende abgerundet oder schwach geknöpft; Vordereckenborsten des Pronotums gut entwickelt, die inneren Vorderrandborsten klein; Vorderecken des Prothorax mit einer Gruppe von kurzen aber kräftigen, dunklen Stacheln. Kopf vorn nicht vorgezogen. Vorderschenkel (♀) mässig verdickt, am Innenrand mit einer unregelmässigen Reihe kleiner, spitz-dreieckiger dunkler Körnchen, ferner mit einer Anzahl Dörnchen mehr gegen die Oberseite des Schenkels. Vordertarsen

<sup>1</sup> ♂ σκότος = das Dunkel.

mit dreieckigem, stumpfem Zahn (beim ♂ wahrscheinlich mit langem Zahn, Vorderschenkel des ♂ wahrscheinlich ohne Zähnenreihe). Flügel in Form und Färbung wie bei *Machatothrips*, ebenso das Abdomen.

Typus generis : *C. dammermani* Pr. (loc. cit.).

Die Gattung kommt ganz nahe *Machatothrips* und ist nur durch die Ausbildung der Vorderschenkel (Höckerchenreihe und Stacheln), ferner die Stachelgruppe an den Vorderecken des Prothorax verschieden.

*Cnestrothrips dammermani* Pries.

♀. Schwarz, einschliesslich Fühler und Beine, Kopfstacheln und Schenkeldornen; Interocellarborsten und Postocularborsten sowie die langen Prothoraxborsten hyalin (oder nur am Grunde leicht getrübt); Borsten am Abdomen weisslich, die des 9. Segmentes und die Analborsten gelblich, am Grunde stärker getrübt. Flügel graubraun getrübt, mit einem in der Mitte geknickten und verdickten Längsstreif (wie bei *Machatothrips*).

Kopf 425 (samt IAF 460)  $\mu$  lang, an den Augen 310, im hinteren Drittel 296  $\mu$  breit; die Augen hinten etwas eckig, ihr lateraler Durchmesser 130  $\mu$ , Wangen parallelseitig, hinten nahe der Kopfbasis geschnürt, Scheitelhinterrand gewulstet; Kopfseiten mit 6-7 sehr wohl entwickelten Stacheln jederseits, wovon der erste 43-47  $\mu$  hinter den Augen am längsten (55-60  $\mu$ ) ist und von den anderen, die im hinteren Drittel eine Gruppe bilden, etwas entfernt ist; die Stacheln sind dunkel und haben am Ende eine hyaline Abrundung; IAF eingekerbt; hintere Ocellen im vorderen Drittel der Augenlänge; vor denselben je eine lange, helle, am Ende stumpfe Borste, Postocularborsten hell, lang, hinter dem Innenrande der Augen eingelenkt, voneinander 134  $\mu$  entfernt; Mundkegel lang, aber nicht scharfspitzig. Fühler 1.08-1.1 mm. lang; Gliederlängen(-breiten): ?(65), 91 (51), 193-197 (51), 193-197 (57-59), 193 (49-51), 162-166 (43), 91 (32), 87 (21)  $\mu$ ; 1. Glied gewölbt, zur Basis etwas, zum Ende stark verengt, oben mit einer kurzen, dunklen stumpfen Borste; das 2. mit 7 (oben 4 unten 3) solchen Borsten, das 3. Glied lang, mit einer Reihe dünner und langer, am Ende offener Borsten, das 4. ebenso, das 8. am Grunde verengt, aber nicht gestielt, vom 7. scharf abgesetzt; das 3. Glied mit 2 (1 aussen, 1 unten), 4. Gl. mit 4, das 5. und 6. mit 2<sup>+1</sup>, das 7. mit 1d. Prothorax etwa 275  $\mu$  lang, seine Oberfläche zeigt eine deutliche Skulptur, die aus anastomosierenden Querlinien besteht, die zu beiden Seiten der Mitte zu einem Wirbel gedreht sind; Vorderrand mässig ausgebuchtet; Pronotum-Borsten wohl entwickelt, die Vorderecken Borsten mässig lang (? 70  $\mu$ ), die Hintereckenborsten lang (? 177  $\mu$ ), stumpf, hell, wie es auch die Coxenborsten sind; Vorderecken des Pronotums mit einer Gruppe (7-11) kurzen Dornborstchen oder Stachelchen. Vorderschenkel dicker als die übrigen, aber im Ganzen nicht als stark erweitert zu bezeichnen, Dicke etwa 216  $\mu$ ; die basale Schenkel-Aussenecke mit einigen wenigen schwachen Stacheln, die Innenränder derselben mit einer Reihe von 10-12 niedrigen, schwarzen, dreieckigen Höckern versehen (8-10  $\mu$  hoch), in der Schenkelmittle, innen, etwas mehr gegen die obere Schenkelfläche stehen einige dunkle (6), mässig dicke Stacheln. Vorderschenkel einfach, Vordertarsen mit einem kurzen, breit dreieckigen, fast stumpfen Zahn. Pterothorax vorn 727  $\mu$  breit, nach hinten verengt. Flügelansatz stehen sehr dicht, Schaltwimpern-Zahl 59. Mitte- und Hinterschenkel am Aussenrande mit einigen kurzen Dornborstchen. Borsten 1 am 9. Segment 520, B. 2: 554  $\mu$ , lang, gerade, haarartig. Tubus 502-520  $\mu$  lang, am Grunde etwa 156-173, am Ende genau 70  $\mu$  breit. Analborsten lang, etwa 520  $\mu$ . Die längste Lateralborste am 7. Segment etwa 345, am 8. Segment nur 215  $\mu$ .

Fundort: RIOUW ARCHIPEL: Doerian, vi.1923, von niederen Pflanzen gekätschert (leg. Dammerman, No. 33). Holotype in meiner Sammlung.

**Polytrichothrips gen. n.**

Fühler 8-gliedrig, die mittleren Glieder mässig lang (cf. *Cryptothrips*), 8. Glied am Grunde verengt, vom 7. scharf abgesetzt; Kopf gestreckt, viel länger als breit, Seiten leicht gewölbt, nach vorn und hinten gleichmässig verengt, mit wenigen, aber starken, dunklen Stacheln besetzt. Augen ziemlich klein, an den Vorderecken des Kopfes. Ocellen klein. Mundkegel breit abgerundet. *Zwei Paar sehr lange, haarartige, geschwungene Postocularborsten, 1 Paar sehr lange Postocellarborsten vorhanden.* Vorderbeine einfach, aber dicker als die übrigen; Vordertarsen mit deutlichem Zahn (♀), Schenkel und Tibien mit einzelnen langen Haaren. Prothorax viel kürzer als der Kopf, seine Borsten *ungewöhnlich lang, haarartig.* Flügel (anscheinend) fehlend. Borsten am 6. und 7. Segment des Abdomens ungemein lang, während die des 8. und 9. Segmentes kürzer sind als der lange Tubus. Dieser konisch, im hinteren Drittel stark eingezogen. Analborsten mässig lang.

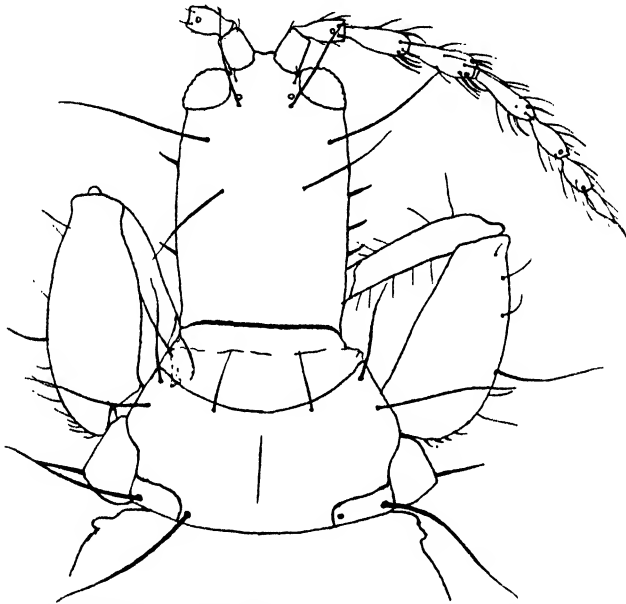


FIG. 1.—*Polytrichothrips pilosus* gen. et sp. n. Kopf und Prothorax des ♀.

Typus generis: *P. pilosus* sp. n.

Nähe *Scotothrips* (*Adiaphorothrips* auctt. nec Bagnall) und *Dichaetothrips* Hood; Postocellarborste wie bei letzterer Gattung, aber die überaus langen, haarartigen, meist geschwungenen Borsten des Körpers und seiner Anhänge, besonders die ungewöhnlich langen Prothoraxborsten (anteroangularen!) gestatten nicht eine Vereinigung dieser Art mit *Dichaetothrips*.

***Polytrichothrips pilosus* sp. n. (fig. 1).**

♀. Schwarz, samt Borsten, nur die Abdominalborsten ein wenig lichter, gelblich sind nur die des 6. und 7. Segmentes. Vorderschienen innen bisweilen der Länge nach undeutlich aufgeheilt, Vordertarsen bräunlich, das 1. und 6.–8. Fühlerglied ganz dunkel, das 2. am Grunde dunkel, gegen das Ende allmählich bräunlich aufgeheilt, das 3. gelbbraun, am Endrand getrübt, 4. trüb-gelbbraun, etwa im Enddrittel stark getrübt, das 5. in der Grundhälfte dunkel gelbbraunlich aufgeheilt, Endhälfte ganz dunkel; bei der Holotype sind die Fühler etwas dunkler, 5. Glied in der Grundhälfte nur wenig bräunlich aufgeheilt.



Kopf 519–536 (samt IAF 554–571)  $\mu$  lang, an den Augen 320–337, in der Mitte der Wangen 370  $\mu$  breit (bei kleinen Stücken 337); Augendurchmesser nur etwa 110  $\mu$ , die Wangen hinter denselben etwa 433  $\mu$  lang; Wangen ganz leicht der Länge nach gewölbt, sodass die kleinen Augen ein wenig abgesetzt sind und der Kopf nach hinten und nach vorn ganz leicht verengt erscheint; Augen auf der Unterseite etwas vorgezogen; Abstand der Augeninnenränder 156  $\mu$ ; Fühlergruben-Distanz 33–35  $\mu$ ; Ocellen klein, im hinteren Drittel der Augen gelegen, Distanz der hinteren Ocellen 90–95  $\mu$ ; 1 Paar schwächere Borsten (? 39–47  $\mu$ ) vor und 1 Paar sehr langer (177–236  $\mu$ ) hinter den hinteren Ocellen, in der Höhe des Hinterrandes der Augen; diese Borsten sind wie die Postocularborsten geschwungen, haarartig, spitzig, dunkel; Postocularborsten 236–296  $\mu$  lang, die hinteren Postocularen 197–235  $\mu$  lang; die ersteren sind etwa 59–63  $\mu$  von den Augen entfernt und stehen vom Rande nur wenig weit ab, also hinter der Mitte der Augen gelegen, nicht etwa hinter ihrem Innenrand; die hinteren Postocularen sind einander viel mehr genähert (Distanz 180  $\mu$ ); Kopfseiten mit 1–3 deutlichen Stacheln versehen, die von den Augen sowohl wie vom Scheitelrande weiter entfernt sind als voneinander. Mundkegel breit gerundet, bei stark gedehnten Stücken die Mitte des Prosternums nicht überragend. Fühler 848–865  $\mu$  lang; Gliederlängen(-breiten): 59–63 (B. 71, Sp. 59), 102–110 (51), 134–150 (57), 138–158 (63), 142–158 (55), 102–112 (47), 89–93 (43), 87–91 (32)  $\mu$ ; zwischen Fühlerbasis und Kopf vorn ein kleiner einspringender Winkel, sodass also die Fühlerbasis nicht dicht an die Augen anschliesst, man kann aber nicht von einem Kopffortsatz sprechen, da die kleine Absetzung den Augenvorderrand nicht überragt. 1. Fühlerglied zum Ende verengt, 2. geradseitig, am Ende abgestutzt erscheinend, areola im vorderen Drittel; 3. Gl. im Grunddrittel stark querverunzelt; Fühler-Borsten lang, und überall in zwei Wirbeln angeordnet, am 3. Glied sind am Ende 6 Borsten vorhanden, längste Borste 80  $\mu$ ; 6. Glied am Grunde etwas, 7. Glied deutlicher geschnürt, 8. am Grunde verengt; 3. Glied aussen im basalen Drittel ganz leicht konvex; Sinneskegel lang, dünn, stark gebogen, spitzig, am 3. Gl. 1 + 1, am 4. Gl. 2 + 2<sup>+</sup>, am 5. Gl. 1<sup>+</sup> + 1<sup>+</sup>, am 6. Gl. 1<sup>+</sup>, am 7. Gl. 1d. Pronotum kurz, in der Mitte 329–346  $\mu$  lang, ohne Coxen 588, mit Coxen 727  $\mu$  breit, Vorderrand stark konkav, Hinterrand stark konvex; innere Vorderrandborsten gut entwickelt, 142  $\mu$  (oder mehr), Vorderecken-Borsten 217–236  $\mu$  lang, dunkel, spitzig, haarartig, Lateralborsten 235–275  $\mu$ , Hinterecken-Borsten 294–312  $\mu$  lang; Coxenborste kurz (90  $\mu$ ), starr, dunkel. Vorderschenkel leicht verdickt, Vordertarsen mit deutlichem, gekrümmtem Zahn; Schenkel aussen an der Basis mit einigen ungleich langen, gebogenen Haaren, in der Mitte aussen mit einem ungemein langem, gebogenen Haar (255–275  $\mu$ ) und auch sonst einigen kürzeren; Vordertibien aussen an der Basis mit einem sehr langen (z.B. 185  $\mu$ ) lichten, geraden Haar; die Mittel- und Hinterschenkel haben aussen in der Mitte ein mässig langes, gebogenes Haar, die Mittel- und Hintertibien hingegen im ersten Drittel ein längeres, lichter (337  $\mu$ ) und ein kürzeres dunkleres, gebogenes Haar; auch vor der Spitze die übliche, lange gerade Haarborste und eine kürzere. Pterothorax kurz, breiter als lang, 657–727  $\mu$  breit. Abdomen mächtig, Tubus 519–545  $\mu$  lang, am Grunde vielleicht etwa 190, am Ende genau 67–71  $\mu$  breit. Länge der lateralen Abdominal-Borsten am 5. Sgm. 467, am 6. 536–554, am 7. Sgm. 623–640, am 8. Sgm. 260, am 9. (B. 1, 2) 380  $\mu$ ; die Borsten am 8. und 9. Sgm. gerade, die übrigen geschwungen. Analborsten kurz, 240–260  $\mu$ ; Abdomen am 5. Segment 605–690  $\mu$  breit.

Fundort: 2 ♀♀ und 2 Larven (II.), SARAWAK: Kalabit country (3000 ft.) (leg. *Mjöberg*). Holotype in der Sammlung des Museums Stockholm, Paratype in meiner Sammlung.

## NEW DATA CONCERNING *THAUMATOXENA* BREDDIN & BÖRNER (DIPTERA PHORIDAE)

By F. W. EDWARDS, F.R.S., F.R.E.S., and H. SCHMITZ, S.J.

IN September 1938 Mr. Eric Burttt sent to Prof. G. D. H. Carpenter at the Hope Department, Oxford University, a minute cockroach-like insect. Accompanying the specimen was the following note regarding the circumstances of its capture :

"During March 1937 I was staying at the rest house at Old Shinyanga, Tanganyika Territory. As is usually the case during this period of the long rains, minute Diptera belonging to the PHORIDAE were being a minor source of annoyance to everyone, owing to their habit of flying near the face, particularly the orifices of the ears, so that they are heard to emit a high-pitched, irritating note.

"On March —, whilst sitting at lunch, I again imagined I was being pestered by a Phorid about the ears and gave a sharp flicking motion with my hand to remove the annoyance. I found I had knocked a couple of minute insects which were *in cop.* on to the table-cloth. At first glance I took them to be midges. They moved rapidly, the stouter-bodied ♀ being dragged by the minute very active male. I attempted to arrest their careering motion by dabbing at them with my finger. I killed the ♀, but the male escaped and I saw it immediately fly away."—E. BURTT.

Prof. Carpenter and Dr. B. M. Hobby at once recognised that the specimen was of unusual interest, and brought it to the British Museum for determination. Reference to the literature of the PHORIDAE soon showed that the specimen belonged to the little-known genus *Thaumatoxena*, and in order to make sure of its specific identity I forwarded it to Father H. Schmitz. As a result of his examination of the specimen and re-study of the literature, Father Schmitz concluded that Mr. Burttt's capture belongs to a new species, and further made the surprising discovery that the supposed males previously attributed to *T. wasmanni* must be females of two different (and hitherto unnamed) species. It had been supposed that the male *Thaumatoxena* is wingless like the female, but Mr. Burttt's discovery has revealed for the first time that this is not the case; the male, as with other more or less related genera of PHORIDAE, is a normal winged fly.

The genus *Thaumatoxena*, sole representative of its subfamily, is confined to Africa, and the few specimens recorded hitherto have all been found in the nests of termites. The female is remarkably unlike an ordinary Dipterous insect, having the body rounded and almost bare, the small antennae sunk into deep pits, the eyes rudimentary, the dorsal plates of the body reduced to one thoracic and two abdominal, the wings reduced to small rigid projections each with a strong apical bristle, and the legs so constructed that they can be folded away underneath the body, the tibiae fitting into deep grooves in the femora. All these peculiarities can be regarded as adaptations to life in nests of termites. The general appearance of the insect can be judged from the accompanying figures. Fig. 1 shows in side view *T. wasmanni* Breddin & Börner (from a figure by Börner in 1908, *Zool. Anz.* **32** : 538); fig. 3 shows in

front view Mr. Burt's specimen. In the related subfamily AENIGMATIINAE, represented in Britain by the myrmecophile *Aenigmatias blattoides* Meinert (= *Platyphora lubbocki* Verrall), the females are also wingless, but their modifications are less extreme, the eyes being less reduced, antennae not sunk into pits, and abdomen with several separate tergites (see fig. 2).<sup>1</sup>

Mr. Burt's remark on the pestering habits of Phorids at Shinyanga is interesting, as it would appear to be the first time that any such complaint has been made against an insect of this family.<sup>2</sup> The habit being so unusual it may be surmised that the flies which act in this way belong to a particular species, and it seems not improbable that they are the males of *Thaumatoxena*.

F. W. E.

Der Fund von Mr. Eric Burt ist aus zwei Gründen sehr interessant, nämlich weil die *Thaumatoxena*-Art neu ist, und weil wir erfahren, dass das ♂ geflügelt ist, während bisher angenommen wurde, dass bei *Thaumatoxena* beide Geschlechter stark verkümmerte Flügel hätten.

## I.

### *Thaumatoxena burti* sp. n.

Die neue Art, die nur in einem etwas beschädigten ♀ Exemplar vorliegt, ist ebenso gross wie *T. wasmanni* Bredd. et Börner, wie Fig. 4, a und b zeigen. Beide Arten erreichen 2·0 mm. Länge. Die Organisation ist in allen wichtigeren Punkten die gleiche, im folgenden werden daher nur die spezifischen Unterschiede hervorgehoben. Zum Vergleich dienen die beiden in Coll. Wasmann vorhandenen, sehr gut erhaltenen ♀♀, nach denen *wasmanni* beschrieben worden ist. Andere Exemplare von *wasmanni* sind nicht bekannt.

Die neue Art ist ein wenig dunkler, Kopf und Thorax sind schwarz braun, bei *wasmanni* mehr dunkel rotbraun. Das dritte Fühlerglied ist bei beiden Arten gelblich weiss.

Grösse, Form und Wölbung des Kopfes sind bei der neuen Art wie bei *wasmanni*. Dass in fig. 4, a die seitlichen Hinterecken des Kopfes weniger weit nach aussen und hinten reichen als in fig. 4, b (*wasmanni*), bedeutet keinen wirklichen Unterschied: bei seitlicher Betrachtung erkennt man, dass auch bei der neuen Art die hinteren Aussenecken des Kopfes ganz nahe an die Stelle heranreichen, die man erhält, wenn man die Grenze zwischen dem ersten und zweiten Abdominalsegment beiderseits nach aussen bis zur Berührung mit dem äusseren Körpermitte verlängert. Ein wirklicher Unterschied herrscht aber in der Behaarung des Kopfes. Man hat bisher in den *Thaumatoxena*-Beschreibungen die genaue Zahl und Stellung der Kopfborsten nicht studiert; doch bietet die Chätotaxie des Kopfes, wie bei Phoriden überhaupt, so auch bei *Thaumatoxena* nicht zu vernachlässigende Artmerkmale, obwohl ihre "Stirnborsten" nur feine (aber ziemlich lange) Haare sind. Auch die Fusspunkte der Haare sind abgeschwächt, aber immerhin als feine eingestochene Punkte erkennbar. Ganz verloren gegangen ist die sogenannte "Grundbehaarung" der Kopfborsterseite, was sonst bei keiner Phoride der Fall ist.

*T. wasmanni* hat zwölf ganz symmetrisch angeordnete Kopfborsten, davon sind die sechs der linken Kopfhälfte in fig. 5 dargestellt. Der Vorderrand (= Unterrand) des Kopfes ist bei *wasmanni* unbeborstet. Quer über die Mitte des Kopfes läuft eine Reihe von acht "Borsten," in fig. 5 mit 1, 2, 3, 4 bezeichnet. 1 steht nahe den Hinterecken, 2 und 3 etwas vor den Fühlergruben und zwar zu beiden Seiten davon, 4 ist der Stirnmediane genähert. Hinter 4 steht etwas weiter auswärts Borste 5, und hinter dieser, ganz am Scheitelrande,

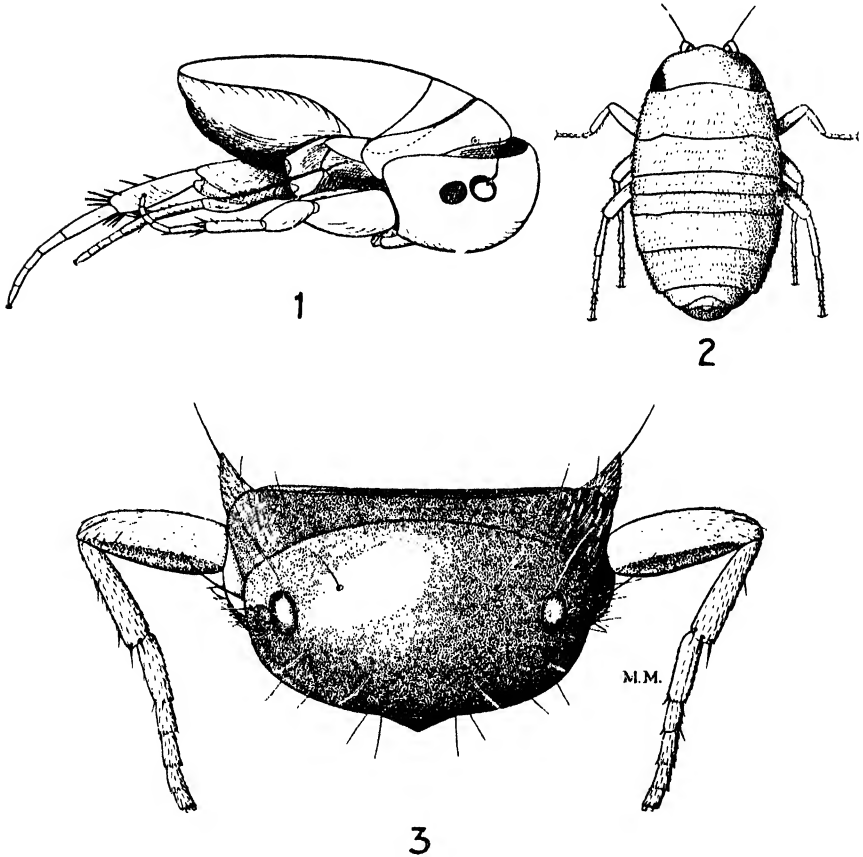
<sup>1</sup> Dr. O. W. Richards suggests that the wing-rudiments of *Thaumatoxena* represents only the basicosta, the rest of the wing having atrophied.

<sup>2</sup> Since Mr. Burt made his observations two complaints have been received at the British Museum of pestering by *Megaselia bovista* Gimm, in coal-mines in Yorkshire.

Borste 6. Das Borstenpaar 5, 5 steht etwas weiter auseinander als das Paar 4, 4 und 6, 6. Die ganze Beborstung kann also in folgender Formel dargestellt werden :

$$\begin{array}{cccccccc} & & 6 & & 6 & & & \\ & & 5 & & 5 & & & \\ 1 & 2 & 3 & 4 & 4 & 3 & 2 & 1 \end{array}$$

Genau dieselben "Borsten" und in derselben Verteilung hat auch die neue Art (Länge der "Borsten" 0.18 mm.), aber es kommen bei ihr noch jederseits vier bis sechs andere hinzu, die in fig. 5 mit punktierten Linien angegeben sind : nämlich je zwei bis drei am



FIGS. 1-3.—(1) *Thaumatoxena wasmanni* Breddin & Börner. ♀ (Nach Börner); (2) *Aenigmatias blattoides* Meinert. ♀. (Nach Meinert); (3) *Thaumatoxena burttii* sp. n. ♀. Vorder Ansicht.

Hinterrand seitwärts, also ganz in der Nähe von Borste 1, und ein Paar am Vorderrande nicht weit von einander, etwa so, dass das linksseitige Paar vom rechtsseitigen ebenso weit wie die beiden Augen von einander entfernt ist.

Die *Fühlergruben* sind der beiden neuen Art etwas grösser als bei *wasmanni*, die Augen dagegen kleiner und noch mehr als bei *wasmanni* verkümmert, vgl. fig. 6, a und b. Form der Fühlergruben bei der neuen Art (fig. 6, b) breit elliptisch, 0.180 × 0.216 mm. Bei *wasmanni* ist die Fühlergrube auch bisweilen elliptisch z.B. 0.160 × 0.190 mm., meist aber einem etwas verzerrten Kreise ähnlich (fig. 6, a) und durchschnittlich 0.170 mm. im

Durchmesser. Die *Fühler* bei der Arten zeigen keinen unmittelbar auffallenden Unterschied; Einzelheiten konnten wegen der versteckten Lage dieser Organe und wegen Beschädigung der Arista bei der neuen Art nicht untersucht werden.

Ein sehr deutlicher Unterschied ist bei den *Augen* in Form, Grösse und Anzahl der Ommatidien zu bemerken. Bei *wasmanni* ist das kreisrunde Auge etwas weiter vom Rande der Fühlergrube entfernt (fig. 6, a), der Durchmesser ist etwas variabel, 0.140 mm. oder weniger; auch bei demselben Tiere können die beiden Augen ungleich gross sein, aber immer gilt, dass bei *wasmanni* das Auge fast so gross ist wie die benachbarte Fühlergrube (fig. 6, a). Es ist ferner bei dieser Art scharf umrandet und äusserst schwach im ganzen gewölbt—diese Wölbung beträgt nur wenige Mikromillimeter. Es ist regelmässig fazettiert, die einzelnen Ommatidien erscheinen wie rotbraune, einander nicht berührende Kreislein in den Maschen eines feinen schwarzen Netzes. Die Anzahl der Ommatidien schwankt um 60 herum. Bei der einen Type zählt man rechts 69, links 56, bei diesem Exemplar sind die Augen deutlich ungleich gross. Das andere Exemplar hat gleichgrosse Augen mit etwa 62 Ommatidien. Alle genannten Umstände wirken zusammen, um das Auge verhältnis-

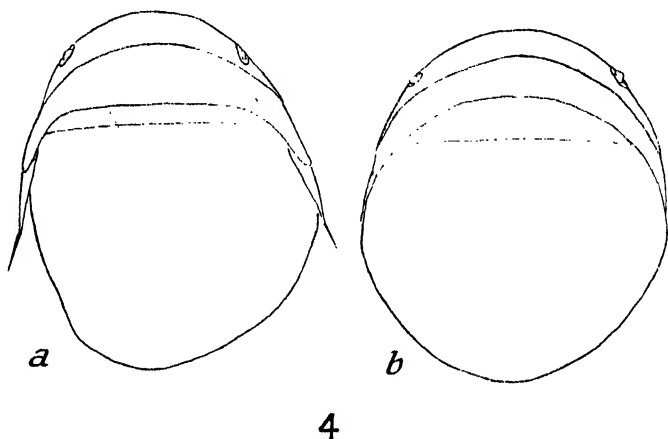


FIG. 4.—Körperumriss von *Thaumatoxena* spp. ♀♀. a, *T. burtii* sp. n.; b, *T. wasmanni* Breddin & Börner.

mässig gut hervortreten zu lassen, wenigstens bei binokularer Betrachtung in auffallendem Licht, aber so stark wie in den Zeichnungen hebt sich das Auge von seiner Umgebung am Objekt selbst nicht ab.

Bei der neuen Art ist das Auge viel schwerer zu finden und kann leicht vollständig übersehen werden. Es ist ganz flach und erhebt sich nicht im geringsten über die Kopfoberfläche, auch die Umrandung und Fazettierung ist weniger deutlich. Wie fig. 6, b zeigt, ist es merklich kleiner als die Fühlergrube, und von elliptischem Umriss, der grösste Durchmesser beträgt etwa 0.115 mm. oder wenig mehr, das Verhältnis der langen Achsen von Fühlergrube und Auge ist zwischen 7 : 4 und 3 : 2 (bei *wasmanni* 17 : 14). Das Auge ist dem Fühlergruben-Rande stärker genähert, es hat wie bei *wasmanni* regelmässige Reihen von Ommatidien (fig. 6, b), die sich nur bei sehr günstiger und intensiver Beleuchtung zählen lassen, es sind im ganzen  $\pm 35$ . In fig. 6, b sind nur die Schnittpunkte des feinen Netzes, in dessen Maschen die Ommatidien liegen, dargestellt. Alles zusammenfassend kann man sagen, dass das Auge der neuen Art in jeder Beziehung stärker reduziert ist als bei *wasmanni*. Bei *T. andreinii* Silv. und den übrigen bisher beschriebenen, aber noch unbenannten Arten (sie wurden alle irrtümlicher Weise mit *wasmanni* oder *andreinii* identifiziert) ist die Anzahl der Ommatidien noch weit geringer, höchstens 16.

Der Thorax ist bei der neuen Art dorsal längs der Mediane gemessen etwas länger als bei *wasmanni* (0.32 bzw. 0.21 mm), aber diese Masse sind nicht absolut zuverlässig, weil sie sich nur auf den von oben her sichtbaren Teil des Thorax beziehen, dessen Vorderrand bei verschiedenen Exemplaren verschieden weit vom Kopfhinterrande bedeckt zu sein pflegt. Sicher ist aber, dass der Thorax der neuen Art dorsal merklich länger ist als bei *wasmanni*, während umgekehrt bei dieser die Länge des ersten Abdominalsegments bedeutend grösser ist als bei der neuen Art, entsprechend fig. 4, a und b (in a = 0.133 mm., in b = 0.247 mm.).

Wie die Beborstung des Kopfes, so ist auch die *Chaetotaxie des Thorax* von den bisherigen *Thaumatoxena*-Beschreibern nicht genügend studiert worden, aber für die Systematik von Bedeutung. Bei *wasmanni* gilt folgendes: Zu unterscheiden sind *abgeschwächte Borsten* und *Feinhaare*. Letztere sind etwas kürzer und haben weniger markierte Fusspunkte, aber beide sind haardünn. Auf dem mittleren Thoraxdrittel fehlt die Feinbehaarung, sie ist auf die beiden seitlichen Drittel beschränkt. Von "Borsten" gibt es eine Querreihe in einem gewissen Abstand vom Vorderrande und eine längs des Hinterrandes. Von beiden Querreihen gilt, dass ihre Elemente seitlich näher bei einander stehen als im mittleren Drittel. Die vordere Querreihe zählt im ganzen 16 "Borsten," die hintere nur etwa 10.

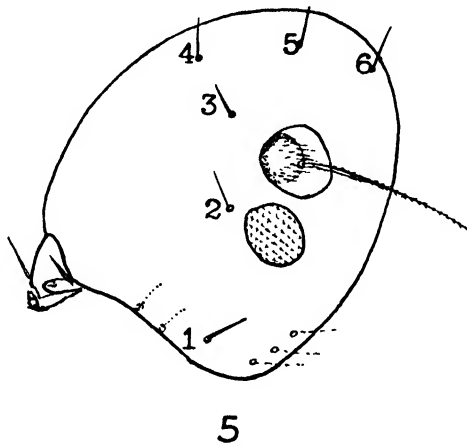


FIG. 5.—Kopf von links, *T. wasmanni* Breddin & Börner. 1–6. Kopfborsten. Punktirt: die ausserdem bei der neuen Art vorhandenen "Borsten."

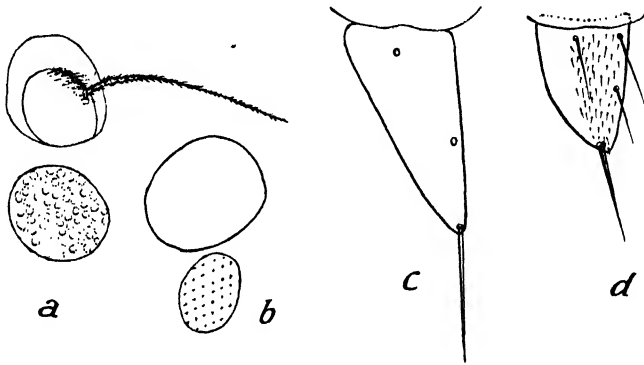
Von der neuen Art lässt sich leider Beborstung und Behaarung nicht mit der gleichen Genauigkeit angeben, weil der Thorax, wie auch der Rücken des Abdomens durch das beim Töten des Tieres austretende Blut verschmiert wurde. Es scheint aber, dass bei der neuen Art das ganze mittlere Drittel des Thorax von *Borsten* gemieden wird, während die *Feinhaare* sogar die ganze mittlere Hälfte meiden und auf das äusserste Viertel jederseits beschränkt sind. Borsten und Feinhaare sind also an Zahl geringer als bei *wasmanni*, an Länge und Stärke jedoch wie dort.

Auch die *Flügelrudimente* beider Arten sind in Grösse und Form deutlich verschieden, wie fig. 6, c und d zeigen. Sie sind bei beiden Arten annähernd rechtwinklig dreieckig, die längere "Kathete" ist der Vorderrand (= Aussenrand). Dieser hat bei der neuen Art die Länge von 0.47 mm., bei *wasmanni* nur 0.36 mm. Da die Flügelbreite an der Basis bei beiden Arten wenig verschieden ist, so ist der Flügel der neuen Art bei grösserer absoluter Länge relativ schmäler als bei *wasmanni*. Auch auf den Flügeln von *Thaumatoxena* gibt es "Borsten" und Haare. Die Haare meiden einen mehr oder weniger breiten Saum längs des Hinterrandes. Borsten gibt es bei *wasmanni* vier, vgl. fig. 6, d; die längste

(Länge bei der neuen Art 0.32 mm., Breite an der Basis weniger als 0.01 mm.) steht nahe der Flügelspitze, zwei andere nahe der Basis, eine in der Mitte des Vorderrandes. Bei der neuen Art ist die Behaarung und wahrscheinlich auch die Beborstung dieselbe, doch konnte die an der Basis des Vorderrandes stehende Borste nicht ermittelt werden, aus dem beim Thorax angegebenen Grunde.

Der kurze erste Abdominaltergit ist bei beiden Arten vollständig nackt.

Der grosse zweite Tergit, eine schildförmige Verschmelzung der bei normalen Phoriden vorhandenen Tergite 2-6, hat bei beiden Arten dieselbe maximale Breite von 1.62 mm. und sieht glänzenschwarz, wie poliert aus. Man kann auch hier Feinhaare und haarähnliche "Borsten" unterscheiden. Bei *wasmanni* gibt es Feinhaare nur längs eines schmalen Streifens am Seitenrande, der an der Basis beginnt und etwa am Ende des zweiten Drittels des Seitenrandes endet. Die "Borsten" meiden einen schmalen Streifen längs der Mediane und sind sonst gleichmässig verteilt, im ganzen jederseits etwa 60, bei denen man etwa 10 nicht sehr regelmässige Querreihen unterscheiden kann. Das Haar- und Borstenkleid der neuen Art scheint annähernd dasselbe zu sein wie bei *wasmanni*.



## 6

FIG. 6.—a, b. Fühlergrube und Auge; c, d. Flügelrudiment; a, d. *T. wasmanni* Breddin & Börner; b, c. *T. burtli* sp. n.

Was die Form und Beborstung der Beine betrifft, so stimmt die neue Art auffallend mit *wasmanni* überein. Femur I hat bei beiden Arten nahe der Spitze ein schwach gekrümmtes Börstchen, das dorsal eingepflanzt, aber etwas posterodorsal orientiert und ein wenig schwächer ist als die Tibialbörstchen. Tibia I bei beiden Arten mit zwei Einzelborsten nämlich einer oberhalb und einer unterhalb der Mitte, beide dorsal eingepflanzt, aber, mehr oder weniger posterodorsal orientiert; ferner mit zwei ungleich grossen dorsalen und 1-2 schwächeren posterioren Endspornen.

Femur II bei beiden Arten gegen Ende mit drei ungleichen Borsten, nämlich einer subapikalen anterioren, starken, die etwas abwärts gerichtet ist, und zwei dorsal eingepflanzten, von denen die eine subapikal, die andere fast ganz apikal ist. Die apikale ist schwächer als die Tibialborsten, und abwärts, dabei bisweilen etwas nach hinten orientiert. Die subapikale ist ungefähr so stark wie die anteriore und im gleichen Sinne wie diese gerichtet, also abwärts und nach der anterioren Seite hin. Tibia II ist bei der neuen Art an beiden Beinen leider abgebrochen, aber wegen der grossen sonstigen Übereinstimmung kann angenommen werden, dass sie gerade so wie bei *wasmanni* beschaffen ist. Bei

*wasmanni* hat die Tibia II eine anterodorsale Einzelborste ungefähr in der Mitte, und dazu drei dorsale, nämlich eine am Ende des ersten Fünftels, eine etwas unterhalb der Mitte und eine subapikale. An der Spitze gibt es drei dorsale und drei ventrale Endsporne; davon sind der mittlere ventrale und der mittlere dorsale am längsten. Ferner gibt es auf der distalen Hälfte dieser Tibie sechs quer gerichtete Kämme von goldgelben Härchen hinter einander.

Femur III hat bei beiden Arten nur zwei von den drei Borsten, die oben von Femur II beschrieben wurden. Es fehlt die fast apikale Dorsalborste. Tibia III hat bei beiden Arten zwei unvollständige Serien von Einzelborsten, nämlich eine anterodorsale und eine dorsale. Die anterodorsale Serie (bei *wasmanni* 4, bei der neuen Art 3 Borsten) befindet sich auf der proximalen Hälfte der Tibie und reicht bis etwas unterhalb der Mitte; die dorsale Serie (bei beiden Arten aus drei Borsten bestehend) reicht von oberhalb der Mitte bis zur Spitze. Zwischen diesen beiden Borstenserien verläuft dorsal eine fast komplette Längsreihe von feinen schwarzen Härchen. Tibienende bei beiden Arten mit drei dorsalen und drei bis vier ventralen Endspornen, und einer posterioren Reihe von mehr oder weniger kurzen Stiften nebeneinander.

*Typus* in British Museum.

## II.

Sehr wichtig ist Mr. Burt's Entdeckung, dass das Männchen der neuen Art geflügelt war. Es ist ausserordentlich zu bedauern, dass es ihm entkommen ist; es wäre sehr interessant gewesen, das Männchen der aberrantesten aller Phoriden kennen zu lernen. Wir wissen aber jetzt wenigstens, dass bei der *Thaumatoxena* von Burt das gepaarte Weibchen vom Männchen im Flüge fortgeführt wird. Dies war schon von mehreren anderen Phoriden mit flugunfähigen Weibchen, besonders aus der Subfamilie AENIGMATINAE, deren Arten alle myrmekophil oder termitophil sind, bekannt. Von einer südafrikanischen Art, *Aenigmatistes blattiformis* Schm., wurde auch bereits eine Skizze eines solchen Pärchens veröffentlicht, (1933, *Natuurh. MaandB.*, 22 : 43).

Aber wir wissen noch viel mehr, oder können es wenigstens mit einer an Sicherheit grenzenden Wahrscheinlichkeit vermuten. Wir müssen vermuten, dass überhaupt alle *Thaumatoxena*-Arten geflügelte Männchen haben, und dass die ganze Literatur über *Thaumatoxena* gründlich revidiert werden muss, da es in dieser Gattung offenbar viel mehr Arten gibt, als man bisher dachte; alle bisher beschriebenen Exemplare sind Weibchen, und die immer als sexuell betrachteten Unterschiede sind Artunterschiede!

Die unglückliche Konfusion geht zurück auf Breddin und Börner 1904. Sie hatten von Wasmann fünf Exemplare eines rätselhaften afrikanischen Termitophilen zur Untersuchung bekommen, drei grössere (nicht von 2.4 mm., wie die Verfasser schreiben, sondern von 2 mm.) und zwei kleinere von 1 mm., die von Haviland in Natal bei *Bellicositermes natalensis* Haviland gefunden worden waren. In der Abhandlung "Über *Thaumatoxena wasmanni*, den Vertreter einer neuen Unterordnung der Rhynchoten" (1904, *SitzBer. Ges. naturf. Fr. Berlin* 1904 (5) : 84-93) beschrieben sie die Tiere, die sie für Hemipteren hielten, als *Thaumatoxena wasmanni*. Die drei grösseren sollten Weibchen, die zwei kleineren Männchen sein. Vom Männchen heisst es, das siebente Abdominalsegment sei wie beim ♀ einfach ringförmig, die folgenden Ringe seien zu einem komplizierten Gebilde verschmolzen, und zwar zu "äusseren Kopulationsorganen von unzweifelhaft männlicher Sexualität" (p. 90 Anm.).



Detailliertere Angaben wurden für später in Aussicht gestellt, sind aber niemals publiziert worden.

An einer von solchen Forschern und so bestimmt ausgesprochenen Behauptung bezüglich des Geschlechts zu zweifeln, schien bisher nicht erlaubt. Aber die Erfahrung Mr. Burt's wiegt doch schwerer und zwingt dazu, bei Breddin und Börner einen Irrtum anzunehmen. Es entbehrt aller Wahrscheinlichkeit, dass bei zwei so nahe verwandten Arten wie *wasmanni* und der oben beschriebenen von Burt die Männchen sich so grundverschieden verhalten sollten. Es ist als sicher anzunehmen, dass die Männchen aller Arten von *Thaumatoxena*, ähnlich wie die aller *Aenigmatistes*-Arten, geflügelt sind. Die angeblichen Männchen von *T. wasmanni*, die Breddin und Börner beschrieben haben, sind Weibchen einer von *wasmanni* verschiedenen Art. Von dieser Art haben wir ausser der summarischen Beschreibung ohne Abbildungen, die sich bei Breddin und Börner findet, eine reichlich illustrierte ausführliche Beschreibung von Trägårdh (an zwei Stellen: 1908, *Ark. Zool.* 4 (10), und 1909, *Zool. Jahrb. (Syst.)* 28: 339-346). Deshalb wird im folgenden diese Art *Thaumatoxena trögårdhi* sp. n. genannt und das im Besitze von Trägårdh befindliche Exemplar zur Type bestimmt. Die Havilandschen Exemplare fehlen in Wasmanns Sammlung. Sie scheinen zuletzt bei Enderlein gewesen zu sein, der sie 1908, *Zool. Jahrb. (Syst.)* 27: 154 erwähnt. Das Weibchen einer dritten Art wurde von Silvestri unter dem Namen *T. andreinii* beschrieben (1906, *Redia* 3: 350-357, mit vielen Figuren), und zwar von Erythraea, als Gast von *Termes bellicosus* Smeathman. Trägårdh hält es für identisch mit seiner Art; aber *andreinii* ist durch Grösse, Färbung (ziegelrot) und Chätotaxie sicher davon verschieden. Dass die Type ein Weibchen sei, wird von Silvestri nicht angegeben, ist aber wegen der Beschreibung der dreigliedrigen Terminalia evident. Das Weibchen einer vierten Art wurde vor zwei Jahren von Poisson beschrieben, nach zwei von Grassé an der Elfenbeinküste bei *Trinervitermes trinervius* (Rambur) und *Bellicositermes natalensis* gefundenen Exemplaren; sie wird im folgenden *Thaumatoxena grasséi* sp. n. genannt. Poisson hält sie fälschlich für das ♂ von *wasmanni*. Die fünfte und letzte Art ist die oben beschriebene *Thaumatoxena* von Burt.

Die bisher publizierten Beschreibungen und Abbildungen ermöglichen es, eine Bestimmungstabelle für die fünf Arten aufzustellen. Vorläufig muss darauf verzichtet werden, die Körperlänge von *Thaumatoxena trögårdhi* als Kennzeichen zu verwenden, weil bezüglich ihrer Unklarheit herrscht. In der Abhandlung von 1908 sagt Trägårdh p. 2, dass sein Exemplar ganz mit dem angeblichen ♂ von Breddin und Börner, dessen Länge von diesen Autoren auf 1 mm. angegeben wird, übereinstimme; aber p. 10 bildet er sein Exemplar in der Vergrösserung 43 ab; da die Figur 73 mm. lang ist, so wäre die wahre Körperlänge 1.7 mm. Möglicher Weise ist 43 ein Druckfehler statt 73; dann ergäbe sich als Körperlänge ebenfalls 1 mm.

#### Schlüssel der bisher bekannten *Thaumatoxena* ♀♀.

1. Körperlänge gegen 2 mm., sie verhält sich zur grössten Breite wie 7 : 6.  
Zweiter Abdominaltergit mit mehr als 100 abstehenden langen Haaren (abgeschwächten "Borsten"). Auge mit mehr als 30 Ommatidien.  
Tibia I mit zwei dorsalen Einzelborsten und ausserdem mit Endspornen 2.
- Körperlänge unter 2 mm., sie verhält sich zur grössten Breite wie 7 : 5 oder 7 : 4½. Zweiter Abdominaltergit mit 20-50 abstehenden Haaren ("Borsten"). Auge mit nur 13-16 Ommatidien. Tibia I ohne dorsale Einzelborsten, mit oder ohne Endsporne . . . . . 3.

2. Auge deutlich, im Umriss rundlich, fast so gross wie die Fühlergrube, mit  $\pm 60$  Ommatidien. Längenverhältnis des ersten und zweiten Abdominaltergits 1 : 6. Flügelrudiment (am Vorderrand) 0.32 mm. lang . . .  
*Thaumatoxena wasmanni* Breddin et Börner, Natal.
- . Auge etwas undeutlich, im Umriss elliptisch, und zwar etwa  $1\frac{1}{2}$  mal länger als breit, viel kleiner als die Fühlergrube, mit etwa 35 Ommatidien. Längenverhältnis des ersten und zweiten Abdominaltergits 1 : 12. Flügelvorderrand  $1\frac{1}{2}$  mal länger . . .  
*Thaumatoxena burtii* sp. n., Tanganyika Territory.
3. Abstehende Haare ("Borsten") des Thorax und Abdomens relativ sehr lang, meist von  $\frac{2}{3}$  der Länge des zweiten Abdominaltergits. Verhältnis von Länge und Breite des ganzen Körpers etwa 7 : 5. . . . .  
*Thaumatoxena trägtårdhi* sp. n. (= *T. wasmanni* Breddin et Börner sogenannte ♂). Zululand.
- . Abstehende Haare ("Borsten") der Oberseite relativ viel kürzer, höchstens =  $\frac{1}{4}$  der Länge des zweiten Abdominaltergits, meist weniger als  $\frac{1}{2}$  4.
4. Körperrumriss breitelliptisch, Längen-Breitenverhältnis 7 : 5. In der Länge verhalten sich Thorax, erster und zweiter Abdominaltergit wie 13 : 0 : 33 (der erste Abdominaltergit fehlt angeblich, falls er doch vorhanden ist, muss er wohl sehr kurz sein). Zweiter Abdominaltergit mit 20-30 abstehenden Haaren ("Borsten") und mit Feinbehaarung auch an und vor dem Hinterrande. Femur I über dreimal länger als breit. Tibia II auf der distalen Hälfte mit anterodorsalen Querkämmen . . . . .  
*Thaumatoxena andreinii* Silvestri, Eritrea.
- . Körperrumriss länglicher, Längen-Breitenverhältnis 7 :  $4\frac{1}{2}$ . In der Länge verhalten sich Thorax, erster und zweiter Abdominaltergit wie  $11\frac{1}{2}$  : 5 : 42. Zweiter Tergit mit etwa 50 abstehenden Haaren ("Borsten"), hinten ohne Feinbehaarung. Femur I nur etwas über 2 mal länger als breit. Tibia II ohne anterodorsale Querkämme . . . . .  
*Thaumatoxena grasséi* sp. n. (= *T. wasmanni* Poisson nec Breddin et Börner), Elfenbeinküste.

**HELIAESCHNA CYNTHIAE, A NEW SPECIES OF DRAGONFLY  
FROM UGANDA (ORDER: ODONATA)**

By Lt.-Col. F. C. FRASER, I.M.S. Retd., F.R.E.S.

IN 1928, *Trans. R. ent. Soc. Lond.* **76**: 136, I described a new species of dragonfly under the name *Gynacantha libyana*. Since then I have received more specimens and now find that the species should have been placed in *Heliaeschna*, a genus very closely allied to *Gynacantha* and only separated by the presence of cross nervures in the median space. Along with the additional specimens of *H. libyana*, is a single male, closely resembling *H. libyana* but considerably smaller and with entirely differently shaped anal appendages. I am able also to describe now the female of *H. libyana*, this sex being unknown at the time the original description was made.

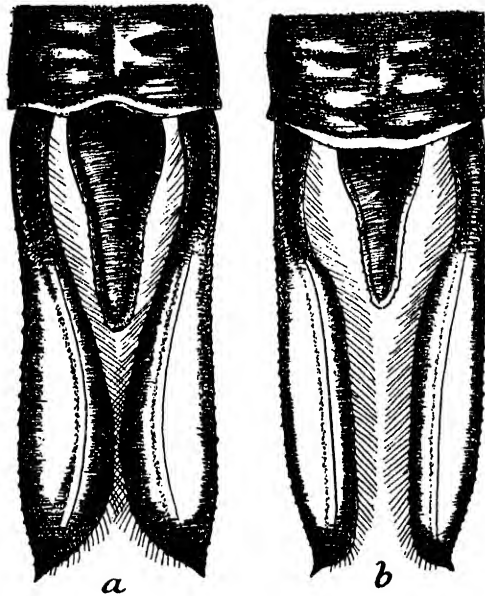


FIG. 1.—a. Anal appendages of *Heliaeschna cynthiae* sp. n., b. The same of *Heliaeschna libyana* (Fraser).

*Heliaeschna libyana* (Fraser).

Female. Abdomen 53 mm. Hind-wing 52 mm.

Exactly similar to the male in colouring. The oblique blackish-brown stripe on the sides of thorax is bordered anteriorly by a yellow stripe of equal thickness. (This stripe

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is partially lost in the males under examination, probably from postmortem changes.) The legs are reddish throughout save for the proximal ends of tibiae and distal ends of femora, which are blackish. Wings similar to those of the male but the basal dark reddish-brown rays rather more extensive. Venational details: 10 cells in discoidal cells of fore-wings, 7-9 in the hind-wings; 2 rows of cells in fork of IRiii and 6-8 rows between it and Rspl; 5-6 median cross nervures; 9-10 cubital nervures; nodal index  $\frac{24-33}{28-25} \mid \frac{34-26}{26-25}$ ; 9-11 hypertrigonal cross nervures; 1 complete and 1-3 incomplete basal antenodal nervures.

Anal appendages very narrow at bases (the ends have been fractured off, as so often happens during ovipositing in species of *Gynacantha* and *Heliaeschna*).

Habitat: UGANDA: Entebbe, alt. 3800 ft. A single female (Capt. C. Pitman).

### *Heliaeschna cynthiae* sp. n.

Male. Abdomen, including anal appendages, 52 mm. Hind-wing 45 mm.

Colour exactly similar to that of *H. libyana* save that there is no sign of the oblique stripes on the sides of thorax. The legs are entirely reddish, including the ends of femora and tibiae.

Wings very broad, reticulation more open than in *H. libyana*, very palely and evenly infumated throughout and with dark reddish-brown rays at the bases of all, exactly similar to those seen in *H. libyana*; membrane pale greyish; pterostigma covering 4-5 cells, shorter than in *H. libyana* but similar in colour; 7 cells in all discoidal triangles; 2 rows of cells in fork of IRiii and 5-6 between it and Rspl; 4-5 cross nervures in median space; 10-11 cubital cross nervures in fore-wings, 8-9 in the hind-wings; anal loop with 14-15 cells; nodal index  $\frac{22-31}{22-24} \mid \frac{28-20}{21-21}$ ; anal triangle 3 celled (*H. libyana* has 4 and not 3 as stated by me); 1 complete and 1 incomplete basal antenodal nervure in all wings.

Anal appendages 7 mm. in length and relatively longer for the size of the insect than in *H. libyana*, pale reddish-brown, narrow for the basal two-fifths, then expanding gradually on the inner side which is strongly convex; the apical fifth again contracting and tapering to a fine point. Inferior appendage half the length of superiors, tapering to an obtuse apex.

Habitat: UGANDA: Entebbe, Lake Victoria. A single male (the type) (*Dr. G. D. Hale Carpenter*), 5.xi.27. This new species is named after Miss Cynthia Longfield. The type is in my collection.

The definitions given for the two genera *Gynacantha* and *Heliaeschna* have differed in only one respect, viz., that of the median space, which is traversed by one or more nervures in the latter, but always free of such nervures in the former. I now add a second and, perhaps, a more important character to distinguish them, viz., the presence of additional basal antenodal nervures in *Heliaeschna*. These are quite unknown in genus *Gynacantha* in so far as species of the Old World are concerned, but they are invariably present in two aberrant New World species, *G. membranalis* Karsch and *G. gracilis* Burmeister; probably these two will need removing to a new genus.

### *Key to the African species of genus Heliaeschna.*

- |    |   |   |   |   |    |
|----|---|---|---|---|----|
| 1. | { | Conspicuous blackish-brown markings at the bases of all wings | . | . | 2. |
|    | { | Basal markings of wings vestigial or absent                   | . | . | 4. |

2. { Superior anal appendages razor-shaped, 2.5 times as long as inferior appendage; 4 cells in the anal triangle; 9-10 cells in the discoidal triangles of fore-wings *libyana* (Fras.).
2. { Superior anal appendages lanceolate, length variable; 3 cells in the anal triangle; 7-8 cells in the discoidal triangles of fore-wings . . . . . 3.
3. { Superior anal appendages 3 times as long as the inferior (2.7 to 1.0); length of hind-wing 54 mm.; femora reddish, distal ends of femora and whole of tibiae and tarsi black . . . . . *lanceolata* Le Roi.
3. { Superior anal appendages only twice the length of inferior; length of hind-wing 45 mm.; legs entirely reddish . . . . . *cyathiae* sp. n.
4. { Wings hyaline, uncoloured; pterostigma 3 mm. in length, black; only 5 cells in discoidal triangles; length of hind-wing 42 mm. *ugandica* McLachlan.
4. { Wings uniformly tinted with fuliginous; pterostigma very long, brown; 8 cells in the discoidal triangles; length of hind-wing 48-51 mm. *fuliginosa* Selys.

## BOOK NOTICE.

*Étude biologique de la race rurale de Culex pipiens L.* By P. LACOUR. pp. 125, 16 figs. 8vo. Clermont-Ferrand. 1937.

This book is an account of breeding experiments carried out by the author on a race of *Culex pipiens*. It comprises nine chapters as follows:—

Conditions of breeding for anautogenous *C. pipiens*.

An examination of some morphological characters.

The life of the "moustique rural" in nature.

A biological study of the larva.

Absence of autogenism in the "moustique rural."

Eurygamy and egg-laying.

The absence of cyclical fatigue.

Hibernation.

General considerations of the life-cycle.

The book is completed by a bibliography and a chapter on conclusions.

Much of the work described in the book is original, and of it a large part was carried out under natural conditions and the remainder under strict laboratory conditions by the author.

The mosquito called "moustique rural" by Prof. Lacour is *Culex pipiens pipiens* Roubaud.

# ADDITIONS TO THE FAMILY CORDULIIDAE INCLUDING DESCRIPTIONS OF TWO NEW SPECIES AND A NEW GENUS (ORDER—ODONATA)

By Lt.-Col. F. C. FRASER, I.M.S. Retd., F.R.E.S.

MR. KENNETH MORTON of Edinburgh has kindly delegated to me the task of describing a new Corduline which he has had in his collection for a long time past. The specimen is labelled "French Guiana," but although there exists some doubt about the locality, there are also strong reasons to believe it to be correct as the specimen was received with other insects from French Guiana. The placing of this species has offered some difficulty, as although the venation is purely that of *Gomphomacromia*, the general facies differs from that of other species belonging to the genus and the anal appendages are rather typical of those found in *Macromia*. On account of these doubts, Mr. Morton has suggested the specific name of "*dubitalis*," which I have adopted.

I take this opportunity to deal with some other species belonging to the same family; these are as follows:—

1. A new *Idionyx* which I have had in my possession since 1933, but which I hesitated to describe because I did not possess the male. There seems little prospect of obtaining this now, and as species of the genus are usually founded on female characters, viz., from the shape of the vesicle, which, in this particular species, is highly specialised, I have now decided to name and describe it.

2. The undescribed female of *Somatochlora braueri* (Selys) from New Zealand. I also figure the male anal appendages which have not been shown before. Martin (1906, *Cat. Coll. Selys* 17: 20) described them as having a slight swelling on the outer side, but it would be more correct to state that they are strongly elbowed and angulated inward near their middle, as shown in my figure. This species is the only one of the genus found in the southern hemisphere, most others being palaearctic, and as such, has always been regarded as an anomaly. I find that it possesses two striking characters which are unshared by any other species in the genus, and I regard these as sufficiently important to remove it to a new genus of its own, which I name *Antipodochlora*.

3. Additions to the descriptions of the superior anal appendages of *Paracordulia villosa* (Rambur) (fig. 1, *e* and *f*). No author dealing with this species appears to have noticed that, in addition to the subbasal spine, there is a second and much smaller ventral spine situated near the middle of the appendages. Martin (*op. cit.*) neither mentions it in his description nor shows it in his figure, which latter is so poor as to be unrecognisable; it is very distinct in my specimens and, concerning the type in the Vienna Museum, Professor Rebel has kindly informed me as follows: ". . . der basale (proximale) Dorn des Anhänges kurzer und etwas breiter als in ihrer Skizze ist. Auch der distale, kleine Dorn ist vorhanden aber sehr klein. In der Daraufrsicht erscheint die innere Begrenzung der Anhänge nicht so gleichmässig gerundet, was aber durch eine andere Lage der Anhänge verursacht sein kann." I therefore give a fresh figure of these appendages.

4. The undescribed female of *Procordulia grayi* (Selys).

## SYSTEMATIC.

### *Gomphomacromia dubitalis* sp. n. (fig. 1, *a* and *b*).

Head: labium, labrum, clypeus and frons dark reddish-brown, the latter with a very deep median fissure dividing the upper surface of face into two triangular facets, the middle

ocellus lying deeply sunk at the posterior part of the fissure. Eyes dark brown but probably emerald green during life; occiput small, dark brown. Prothorax and thorax dark olivaceous brown with a poorly marked metallic green reflection on dorsum and a more brilliant metallic bluish-green reflection on the sides. The latter marked with two narrow, oblique, citron-yellow stripes, one on the mesepimeron, the other on the posterior border of the metepimeron. Legs blackish or dark reddish-brown; all tibiae keeled.

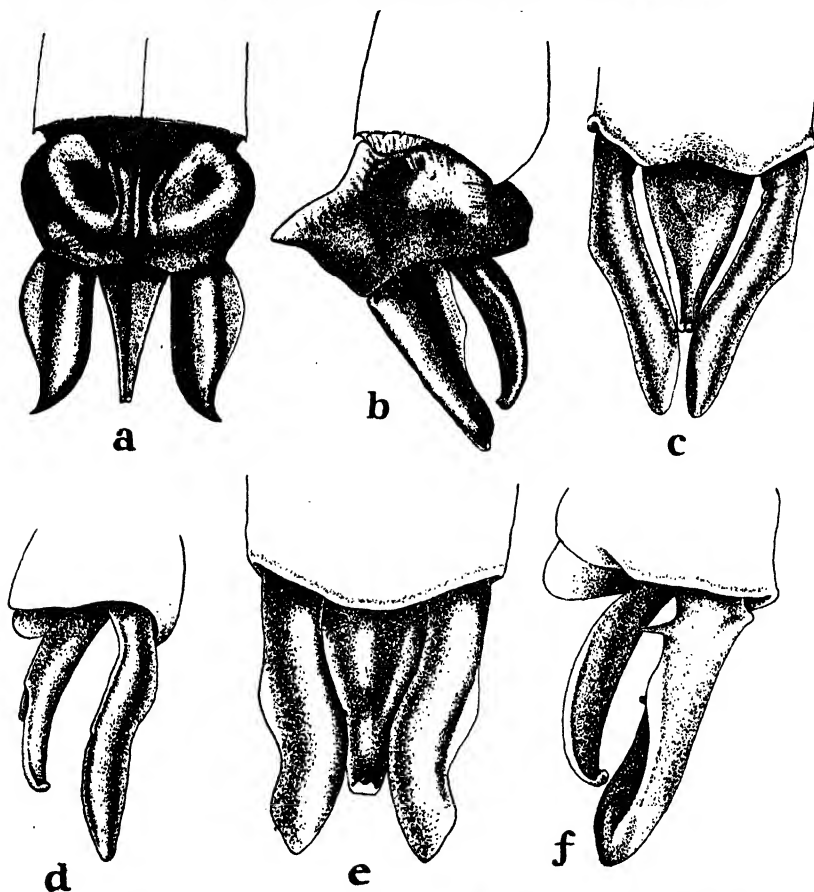


FIG. 1.—a. Dorsal view of segment 10 and anal appendages of *Gomphomacromia dubitalis* sp. n.; b. The same seen from the left side; c. Dorsal view of anal appendages of *Antipodochlora braueri* (Selys); d. The same seen from the left side; e. Dorsal view of anal appendages of *Paracordulia villosa* (Rambur); f. The same seen from the left side. (Camera lucida studies all drawn to the same scale.)

Wings slightly infuscated; venation rather open; nodal index— $\frac{5-11}{8-7} \mid \frac{11-6}{7-9}$ ; subnodal space, distal to nodus, with 4 cross-nervures in fore-wings, 5 to 6 in the hind-wings; all triangles entire; discoidal triangle in hind-wing, with basal side slightly distal to the level of arculus; anal-loop abbreviated, 7-celled; a single row of post-trigonal cells in fore-wings for 10 to 11 cells, extending thus to level of nodus; only 3 post-trigonals in the hind-wings; discoidal field dilated slightly at termen, 3 to 4 cells wide at this level in fore-wings. Pterostigma short, 2 mm. in length, dark reddish-brown. Anal triangle 2-celled; sectors of

areculus meeting only at origins; 2 rows of postcubital cells in anal area of fore-wings; 2 rows of cells between anal-loop and posterior border of wing.

Abdomen blackish-brown marked with citron-yellow as follows: segment 2 with the oreillets, a pair of narrow postjugal spots and a spot at the apex of lobe; segments 3 to 7 with paired crescentic antejugal spots on dorsum, which become progressively smaller from segments 4 to 6 but enlarge again on segment 7, where they are almost confluent over dorsum of segment; remaining segments unmarked. Segment 8 with a small conical protuberance beneath, situated at its basal third, closely similar to, but smaller than, the protuberance found in *Neocordulia androgynis* Selys. Segment 10 with a very robust cone-like, mid-dorsal spine prolonged basally as a keel-like ridge, which is bordered each side by a deep depression. Anal appendages as long as segment 10, the superiors slightly the longer; these very short and robustly built, subcylindrical but with a lateral keel-like expansion on the outer side for the basal two-thirds; tapering to a point which is turned out rather abruptly. Seen in profile, they are very broad at base and then taper gradually to near the apex and very abruptly so at the point where the lateral expansion ends. Inferior appendage narrowly triangular, minutely emarginate at apex, which is curled upwards rather strongly.

*Habitat*: FRENCH GUIANA. Under the old Selysian classification, this new species belongs to the large genus *Gomphomacromia*, which includes *Syncordulia*, *Oxygastra*, *Nesocordulia*, *Neocordulia* and *Gomphomacromia*. In its venation it resembles *Gomphomacromia*, but by the process beneath segment 8, similar to that of *N. androgynis*, it appears to be allied to the sister genus *Neocordulia*. A knowledge of the female genitalia is necessary to settle this point and for the time being one must abide by the venation and place it in *Gomphomacromia*. From the four known species belonging to this genus, viz., *G. paradoxa* Brauer, *G. fallax* McLachlan, *G. nodisticta* Ris, and *G. longipollex* Calvert, all from Central and South America, *G. dubitalis* is easily distinguished by the entirely different shape of its anal appendages, which, as has been stated above, are remarkably similar to those of *Macromia*. The type is in the Morton collection.

Whilst dealing with the two closely related genera *Neocordulia* and *Gomphomacromia*, it is well to point out a curious error in Martin's Monograph (*op. cit.*: 55 and 56). Here he has placed *Neocordulia volxemi* (Selys) in *Gomphomacromia*, giving as his reasons for this step, that the type has a single row of post-trigonal cells in the fore-wing, yet, if one refers to the figure of the wings of the type shown on p. 55, it will be seen that there are actually 2 rows of post-trigonals! This latter character, in conjunction with the short ovipositor of the species, places it without any doubt in the genus *Neocordulia*. Kirby has shown it correctly as a *Neocordulia* in his Catalogue.

#### *Idionyx perlyashola* sp. n.

Female. Abdomen 38 mm. Hind-wing 34 mm.

Head: labium ochreous; labrum reddish-brown with two very large, diffusely limited citron-yellow spots at its centre; anteclypeus reddish-brown, postclypeus steely bluish-black; frons dark metallic green; vesicle steely blue-black, very large, steeply conical, its apex bifid; eyes emerald green; occiput black. Thorax metallic green with two narrow citron-yellow stripes on each side, one on the mesepimeron, the other on the posterior border of the metepimeron. Beneath yellowish with a clover-leaf-shaped spot blue-black metallic. Legs dark reddish-brown. Wings slightly infumated, with the areolets paler centrally; bases of all wings saffron-suffused to as far out as the second antenodal nervure; pterostigma black, covering two and a half cells; nodal index— $\frac{9-14}{8-9} \mid \frac{14-7}{9-9}$ ; anal-loop 11 celled. Membrane white, tipped with brownish at apex. Abdomen black, unmarked.



*Habitat*: TRAVANCORE: Western Ghat out from Manar, alt. c. 3500 ft., 17.v.33. This species is quite easily distinguished from all others of the genus by the highly specialised shape of its vesicle. Type in my own collection. The name is derived from the Tamil for "great forest" and refers to the vast expanse of primeval jungle which was overlooked from the spot where I took this species.

#### *Antipodochlora* gen. n.

A genus with the characters of *Somatochlora* Selys but differing in the following points: frons very broad and flattened anteriorly, as broad or broader than thorax, fringed laterally with stiff, bristle-like hairs; arculus situated at the level of the second antenodal or but a shade proximal to it.

Genotype: *Epitheca braueri* Selys.

The shape of the head is closely similar to that of *Allogaster* and *Cephaloeschna* and quite unlike that of any other species of *Somatochlora*. In the latter genus, the arculus is situated midway between the first and second antenodals; recession of the arculus is a modern development, so that the distal position of this structure in *Antipodochlora* clearly demonstrates it as more archaic.

#### *Antipodochlora braueri* (Selys) (fig. 1, c and d).

Female. Abdomen 37–38 mm. Hind-wing 37–38 mm.

Head: labium ochreous, labrum reddish-brown, anteclypeus pale creamy-yellow, postclypeus and frons dark reddish-brown, the latter bronzed green above and with a large yellow spot on each side against the eyes (this spot present also in the male, although not mentioned in the Selysian description). Rest of head and thorax as in the male. Paler markings on abdomen more extensive than in the male and more extensive on the last three segments than on the preceding (these markings are probably rich ochreous in the living insect but they are largely obscured by decomposition in my specimens as well as in the type). Wings slightly infumated, this tending to form a network corresponding to the cellules of the wings; the infumation deepened to form a large oval patch in fore-wings extending from near the nodus to slightly distal of the pterostigma. Extreme base of hind-wings diffusely saffron-tinged. Nodal index higher than in the male— $\frac{9-8-10}{10-6} \mid \frac{10-8-10}{6-9}$ ;

other venational details similar to the male.

Ovipositor half the length of segment 8, triangular, deeply cleft for its apical two-thirds, the apices of the lobes thus formed turned slightly outwards. Anal appendages as long as segment 9, cylindrical, tapering to an obtuse point.

#### *Procordulia grayi* (Selys).

Female: abdomen 34 mm. Hind-wing 34 mm.

Exactly similar to the male save for sexual characters. In both sexes there is a very broad fascia on each side of frons pale creamy-yellow, which has not been mentioned in the Selysian description.

Wings similar to the male but the infuscation deepened along the whole costal border of both fore- and hind-wings. Nodal index, in both sexes, very variable—7 to 9 antenodals and 6 to 9 postnodals in fore-wings, 5 to 6 antenodals and 7 to 9 postnodals in hind-wings.

Ovipositor represented by three small tubercles, nearly obsolete, its function apparently taken over by the overlapping pleura. Anal appendages very long, as long as the combined 9th and 10th segments, cylindrical with obtusely pointed apices.

I have to thank Mr. G. C. Hudson of New Zealand for a large number of both sexes of this species and of *A. braueri* (Selys).

# ON THE RELATIONSHIP OF THE HYMENOPTEROUS GENUS *OLIXON* AND ITS ALLIES, TO THE POMPILIDAE (HYM.).

By J. A. REID, A.R.C.S., B.Sc.

Communicated by Dr. O. W. RICHARDS, F.R.E.S.

WHILST engaged in a comparative study of the thorax of wingless Hymenoptera, I examined specimens of *Olixon testaceum* Cameron in the collection of the British Museum. The following day I was examining wingless Pompilids and looked at a specimen of *Apteropompilus dentatus* Cameron. I was astonished to find that it was extremely like *Olixon testaceum*; so much so that the two genera are obviously closely related.

The relationships of *Olixon* have always been a puzzle. Cameron, who originally described the single species *testaceum* in 1887 and erected the genus *Olixon* for it, placed it in the BRACONIDAE, though admitting that he was uncertain what its true natural position was and regarding it as having points of similarity with the BETHYLIDAE. Ashmead (1900) placed it in the BETHYLIDAE, subfamily EMBOLEMINAE. Kieffer (1911) redescribed it and placed it without question in the BETHYLIDAE under the name *Saphobethylus pallidus*. Turner and Waterston (1917), by comparison of the types, showed that *Saphobethylus pallidus* Kieff. was a synonym of *Olixon testaceum* Cameron and on the grounds of similarity of the male genitalia with those of *Rhopalosoma*, and because of the long antennae, suggested that it belonged to the RHOPALOSOMIDAE; the specimens in the British Museum collection were placed under that family.

However, a comparison of *O. testaceum* with *Apteropompilus dentatus* showed at once that *O. testaceum* is a Pompilid, provided that *A. dentatus* is correctly placed in the POMPILIDAE. Of this there seems to be no doubt, for though originally placed by Cameron (1904) in the genus *Apteropompilus* Brauns, 1898, it is now placed in the genus *Psyllosphex* Arnold, 1934, along with two other species described by Arnold. Though the species of *Psyllosphex* have the wings much reduced or absent, they seem to be true Pompilids and, moreover, have a number of points of resemblance with the genus *Homonotus* Dahlb. in which the species are normally winged.

Dr. O. W. Richards has examined the specimens and confirmed my opinion that *Olixon* is undoubtedly a Pompilid genus of the subfamily HOMONOTINAE. I am deeply indebted to him for his help and advice and for putting me in touch with the literature on *Olixon*. I should also like to thank Mr. R. B. Benson for putting the facilities of the British Museum (Natural History) at my disposal.

Although *Olixon* is so clearly related to *Psyllosphex*, it is nevertheless generically distinct and thus there is no question of sinking a generic name. There follows below a list of the more important points of similarity and of difference between *Apteropompilus* [*Psyllosphex*] *dentatus* and *O. testaceum*. I hope that an examination of these and of the figures (which have been drawn using a binocular microscope and a squared eyepiece) will enable anyone who has not access to specimens of both genera to reach the same conclusions as to the affinities of *O. testaceum* as are expressed here.

It should be mentioned at this point that Brues (1922), in a paper on *Olixon* and allied genera, gives a key to separate the genera, in which he has evidently

used Cameron's description of *Olixon*, which is not wholly correct. Brues separates *Olixon* on the character of the second segment of the abdomen, stated to be only a little longer than the third; this is implied in Cameron's description, but in fact the second segment is twice or more times as long as the third (fig. 1, a). Cameron also states that the wings are without veins, which is incorrect.

Characters shared by *Olixon testaceum* Cameron and *Psyllosphex dentatus* (Cameron).

1. The shape of the head. In particular its outline in dorsal and in side view, and the concave occiput (fig. 2, c) which gives it a very characteristic appearance.

2. The maxillary palps. These are six segmented; the third segment bears an apical spine and the terminal three segments are considerably more slender than the first three (see Arnold, 1935).

3. The presence of a furrow (malar furrow) in each malar space connecting the ventral margin of the eye with the base of the mandible.

4. The shape of the thorax in dorsal view. In particular the posterior region of the propodeum which terminates on each side dorsally in an acute tooth. The posterior face of the propodeum is concave and nearly vertical.

5. The position of the propodeal spiracle, which in contrast to its position in winged Pompilids in the anterior third of the propodeum, occupies a secondary position in the posterior half or two-thirds of the propodeum.

6. The front femora. These are swollen, though much more strongly in *P. dentatus*.

7. The shape of the abdomen and the relative sizes of the segments. In particular the characteristic condition of the first segment, which is somewhat campanulate and is separated from the second by a deep crenulate groove above and below, the groove being somewhat overhung by the posterior margin of the first segment. In *P. dentatus* the groove is not crenulate ventrally.

8. The tarsal claws and pulvilli of the females. The former are bent at right angles near their tips and the pulvilli are large.

Characters in which *O. testaceum* and *P. dentatus* differ from one another.

1. The antennae. Those of *O. testaceum* are about as long as the body, and the segments of the flagellum are five or more times as long as wide. The antennae of *P. dentatus* are only about as long as the head and thorax and the segments are less than three times as long as wide. The pedicel of *P. dentatus* is more than half as long as the scape; that of *O. testaceum* is only one-third as long as the scape.

2. Viewed from above the head of *O. testaceum* ♀ is transverse and has a well-marked rim round the occipital margin. Neither ♂ nor ♀ has ocelli. The head of *P. dentatus* ♀ is quadrate; the posterior rim is much fainter and ocelli are present, though the ♂ lacks the median one.

3. Dorsally the eyes of *O. testaceum* approach closely to the occipital margin of the head; the eyes of *P. dentatus* are separated by about their width from the occipital margin.

4. The malar space of *O. testaceum* is longer than that of *P. dentatus* so that the length of the malar furrow is considerably greater than the basal width of the mandible, while in *P. dentatus* the malar furrow is shorter than the basal width of the mandible.

5. In the ♀ of *O. testaceum* the fourth segment of the hind tarsi, and to a

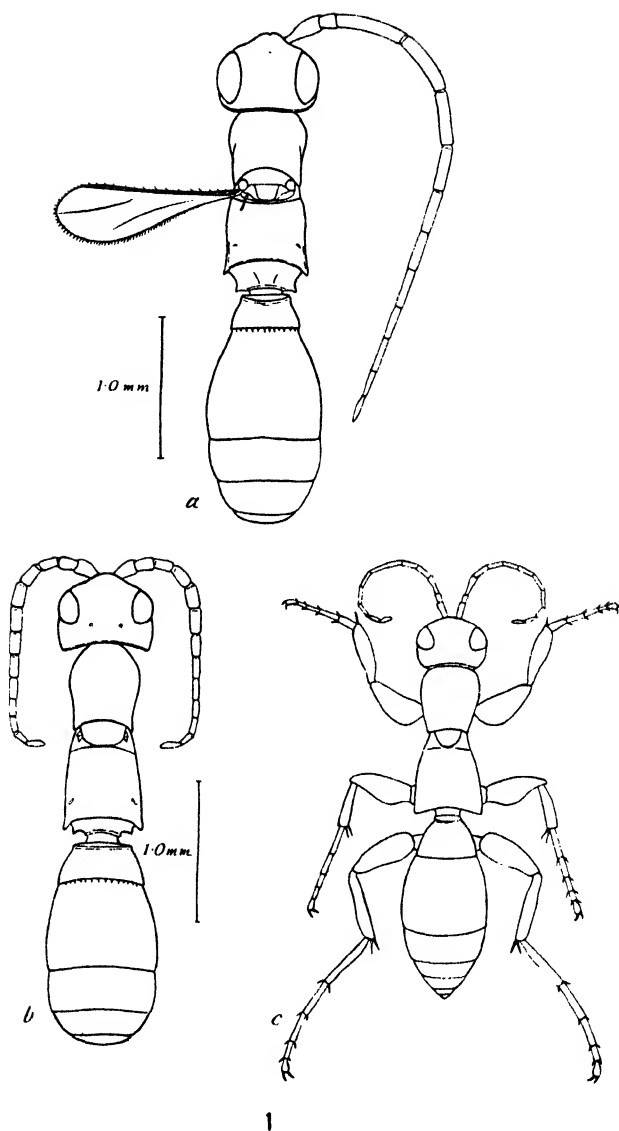


FIG. 1.—a. *Olixon testaceum* ♂, dorsal view; b. *Psyllosphex dentatus* ♂, dorsal view; c. *Algoa heterodoxa* ♀ (after Brues).

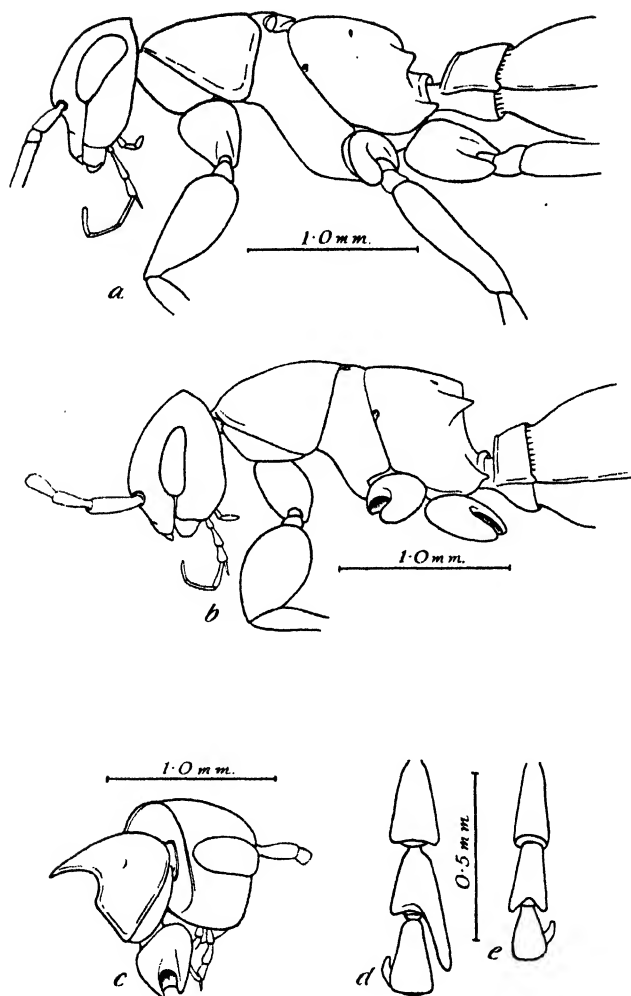


FIG. 2.—a. *Olixon testaceum* ♀, head, thorax and first abdominal segment, lateral view; b. *Psyllophex dentatus* ♀, same; c. *O. testaceum* ♀, head viewed from a postero-lateral angle to show the concave occiput; d. Terminal segments of the right hind tarsus of *O. testaceum* ♀. Bristles and hairs not shown; e. *P. dentatus* ♀, same.

lesser degree of the other tarsi, is very asymmetrically bilobed (fig. 2, d), the outer lobe being much larger than the inner one. This tarsal segment in the female of *P. dentatus*, though bilobed, is not asymmetrical.

6. Except for a blackish band towards the apex of the second abdominal segment, the eyes, the tips of the mandibles and the malar furrows, which are black, *O. testaceum*, as its name implies, is testaceous in colour. *P. dentatus* is dark brown to black. For a coloured figure of *O. testaceum* see Cameron (1887).

7. *P. dentatus* has the tegulae very reduced and the fore-wings reduced to minute scales (the hind-wings entirely absent). The scutellum is not distinguishable. *O. testaceum* has paddle-shaped fore-wings reaching beyond the apex of the first abdominal segment. The hind-wings are reduced to tiny thread-like strips. The scutum and scutellum are plainly visible. However, the condition of *P. dentatus* seems to be rather exceptional, for Arnold (1935) figures the thorax of *P. saltator* Arn. and *P. myrmosaeformis* Arn. which both possess fairly well-developed tegulae, while *P. saltator* has fore- and hind-wings apparently very similar to those of *O. testaceum*. The scutum and scutellum in both these species are similar to those of *O. testaceum*.

It is worth noting here that Arnold knew only Cameron's type specimen of *P. dentatus* which is a male, and he expresses the opinion that *Psyllosphex myrmosaeformis* Arn. may possibly be the female of *P. dentatus*. However, there is now in the British Museum collection a female apparently correctly identified as *P. dentatus*. This specimen was collected by R. E. Turner at Port St. John, Pondoland, S. Africa, in 1924. It has a mesonotum like that of the male type, in that the scutellum is missing or not defined, and the tegulae and wings are extremely reduced. The female of *P. myrmosaeformis* has a scutellum which Arnold describes and figures, and therefore *P. myrmosaeformis* and *P. dentatus* would appear to be distinct from one another.

Brues (1922) has expressed the opinion that the genera *Olixon*, *Harpagocryptus*, *Algoa*<sup>1</sup> and *Nealgoa* are closely related to one another. Examination of the descriptions he gives makes it almost certain that *Algoa* Brues, 1910 and *Nealgoa* Brues, 1922 are also Pompilid genera closely related to *Olixon*.

The affinities of *Harpagocryptus* Perkins, 1908 form a most intriguing puzzle. On looking up the reference given by Brues one finds that the paper he refers to was by R. C. L. Perkins, not J. C. Bridwell as he states, and that Perkins and not Bridwell founded the genus and described the single species *H. australiae*. The insect was reared from an Australian cricket of the family TRIGONIDIIDAE on which the larva had formed a sac like that made by some Dryinids upon Homoptera. This larval habit makes it extremely unlikely that *H. australiae* can be a Pompilid, since, so far as their habits are known, the Pompilids are exclusively hunters of spiders or occasionally parasitic upon other Pompilids. On the other hand, Perkins states that "it is clearly allied to the Central-American *Olixon* of Cameron" and his description fits that of *Olixon* remarkably closely. I quote his generic diagnosis of *Harpagocryptus* in full so that the characters may be compared with those of *Olixon*.

### *Harpagocryptus*.

Perkins, R. C. L., 1908, *Proc. Hawaii. ent. Soc.* 2: 27-35.

Head transverse in dorsal aspect, produced in the middle in front, large, wider than the thorax; the occiput arcuately emarginate; ocelli very feebly developed, the anterior one

Kieffer (1914) in "Das Tierreich 41" replaced *Algoa*, which is preoccupied, by *Algoella*.

almost or entirely aborted. Antennae 12 jointed, elongate, filiform, all the joints long excepting the small pedicel. Mandibles pointed at the tips to form a large acute tooth, internal to which are three very minute teeth on the edge. Maxillary palpi long, six jointed, the first joint short and stoutish, the second joint very elongate, twice as long as the first, slender at the base, clavate; third shorter than second, moderately stout, sub-parallel sided; fourth, fifth and sixth, slender, elongate, sub-equal. Labrum distinct, clypeus well defined. Prothorax large and long, narrowed posteriorly, and there emarginate; mesothorax very small, tongue shaped; tegulae distinct, front wings narrow, strap like, reaching to the posterior face of the propodeum, hind-wings wanting. Propodeum very long, its superior posterior angles produced into a strong acute tooth on each side. Front femora very stout, intermediate less strongly so; claws short, stout; pulvilli large, tarsi densely pubescent beneath. Abdomen elongate ovate, second segment much the longest.

This description only differs definitely from the characters of *Olixon* in three respects, and with those exceptions it may be taken as a supplementary description for *Olixon*. The presence of ocelli, the fore-wings strap-shaped rather than paddle-shaped, and the lack of hind-wings are the three exceptions; and in addition the colour of *H. australiae* is dark. An examination of such critical points as whether or no the third segment of the maxillary palps bears a spine at its apex, whether the first abdominal segment is separated from the second by a crenulate groove, whether the tarsal claws are bent at right angles near their tips, and whether the fourth tarsal segments are asymmetrical, should decide whether *Harpagocryptus* is really allied to *Olixon* and is therefore a Pompilid. If it should prove to be related to *Olixon* we shall have either to revise our ideas of the habits and affinities of the POMPILIDAE or to suppose that there has been some mistake made in recording *H. australiae* as a parasite of crickets.

Fig. 1, c of the ♀ of *Algoa heterodoxa* Brues is from the figure by Brues (1910). Comparison of the following characters of *Algoa heterodoxa* with the table of differences between *P. dentatus* and *O. testaceum* given earlier shows that *Algoa* is much more like *Psyllosphex* than like *Olixon*.

#### Some characters of *Algoa heterodoxa* Brues.

1. Head quadrate, not broader than long, concave posteriorly.
2. Antennae short, the segments barely three times as long as wide.
3. Maxillary palpi six segmented, the third segment with a spine at its apex.
4. Malar space with a furrow which is shorter than the basal width of the mandible.
5. Eye separated by its own width from the hind margin of the head. The cheeks and temples margined behind.
6. Wings absent, tegulae obsolete.
7. Front femora greatly thickened.
8. Propodeum with the hind margin arcuately excised, the hind angles produced and the posterior surface concave.
9. Ocelli obsolete.
10. Second abdominal segment much the longest and distinctly constricted at the base above and below.
11. Colour piceous.

Except for the obsolescence of the ocelli and the hind angles of the propodeum being produced, rather than strongly dentate, these characters are the same as those of *Psyllosphex*.

A similar table shows that *Nealgoa* is more nearly related to *Olixon* than to *Psyllosphex*.

Some characters of *Nealgoa* Brues, 1922.

1. Head from above as long as broad, produced medially in front, truncate behind.
2. Antennae longer than the head and thorax, segments long and slender.
3. Malar space much longer than the basal width of the mandible, but having no furrow.
4. Eyes approaching close to the occipital margin.
5. Pronotum almost as wide as the head.
6. Fore-wings like those of *O. testaceum*, paddle-shaped with a strong costa, which, however, extends to the tip of the wing; and two other weak veins. Hind-wings absent.
7. Propodeum with teeth at the postero-dorsal angles, posterior face concave and almost vertical.
8. First segment of the abdomen more or less campanulate, separated from the second above and below by a strong constriction.
9. Fourth tarsal segments thickened and emarginate at apex.
10. Ocelli obsolete.
11. *N. banksii* Brues, the only species, is non-punctate and fulvo-ferruginous in colour.

Characters 2, 3, 4, 6, 10 and 11 are those which indicate affinity with *Olixon* rather than *Psyllosphex*, while 1 and 5 are more like the condition of *Psyllosphex*; 7 and 8 are characters common to *Olixon* and *Psyllosphex*, while the lack of a furrow in the malar area is a difference from both.

A further consideration, which lends strong support to the contention that *Algoa* is close to *Psyllosphex* and *Nealgoa* to *Olixon*, is that of geographical distribution. The genus *Psyllosphex* is South African, and the 4 female specimens, on which the genus *Algoa* was founded by Brues, were collected by Dr. Brauns at Algoa Bay, S.E. Africa. *Olixon testaceum* is recorded from Panama and Mexico amongst other localities; *Nealgoa banksii* Brues comes from Long Island, New York. In this connection there is a further interesting point: in the British Museum collection there is one very dirty specimen (female) of an unnamed species of Pompilid from Cairns, Australia. This insect appears to be somewhat intermediate between *Psyllosphex* and *Olixon*, for it has the asymmetrical fourth segment to the hind tarsi which is an important character of the ♀ of *O. testaceum*, and the fore-wings are closely similar. On the other hand, the segments of the antennae are short, and the antennae, now broken, were evidently about equal in length to those of *P. dentatus* (the short antennae show that it cannot be a *Harpagocryptus*); the insect is black.

The reader may have remarked the fact that Cameron made the original descriptions of *Olixon testaceum* and *Apteropompilus dentatus*; but in justice to him one must remember that he described *O. testaceum* 16 years before *A. dentatus*. Brues (1910), in his original description of *Algoa heterodoxa*, noticed that it bore a resemblance to a Homonotine Pompilid, but allied it with the SCLEROGIBBIDAE. In his later paper Brues (1922), as may be seen, allies *Algoa* with *Olixon*, but does not attempt to settle the affinities of *Olixon*, beyond stating that he does not agree with the views of Turner and Waterston who placed it in the RHOPALOSOMIDAE. These authors based their opinion on



a similarity in the male genitalia of *Olixon* and *Rhopalosoma* and on the fact that the antennae of *Olixon* are long. But since the antennal segments of the latter lack the spines which are characteristic of those of the former, this character does not seem to be important. Dr. Richards is of the opinion that in making out the relationships between families of Hymenoptera, the male genitalia are somewhat difficult to use and sometimes of dubious value. On the whole it seems unlikely that *Olixon* has any real affinity with the RHOPALOSOMIDAE, and if this is so it is not a connecting link between the POMPILIDAE and RHOPALOSOMIDAE.

#### SUMMARY.

By comparison of the types of *Olixon testaceum* Cameron (= *Saphobethylus pallidus* Kieffer) and *Psyllosphex dentatus* (Cameron) it is shown that the two genera are closely related, and since *P. dentatus* is a Pompilid, *O. testaceum* therefore also belongs to the POMPILIDAE. Though the genera *Psyllosphex* and *Olixon*, as represented by *O. testaceum* and *P. dentatus*, are closely related they are generically distinct. By examination of the descriptions, it seems almost certain that *Algoa* and *Nealgoa*, considered by Brues to be related to *Olixon*, are also Pompilids; *Algoa* being closely related to *Psyllosphex* and *Nealgoa* to *Olixon*. The position of *Harpagocryptus* remains uncertain, for although the description is closely similar to that of *Olixon*, the recorded habit of the insect as a semi-endoparasite of crickets, makes it difficult to believe that it can be a Pompilid.

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## A REVISION OF THE MALAYAN SPECIES OF *RAPALA* MOORE (LEPIDOPTERA : LYCAENIDAE)

By A. Steven CORBET, F.R.E.S.

THE high degree of individual and geographical variation which characterises many of the species of *Rapala* is doubtless responsible for the unsatisfactory arrangement of the genus in Seitz' monograph (1927, *Grossschmett. Erde* 9 : 1001-1007), which omits several names and is based largely on Fruhstorfer's papers (1911, *Berlin. ent. Z.* 56 : 253-263 and 1913, *Deuts. ent. Z.* "Iris," 37 : 177-178). Toxopeus (1929, *Tijd. Ent.* 72 : 222-224) published an annotated list of the Javanese species, but he followed Seitz in separating *R. pheretima* into three "species," and Evans (1932, *Ident. Indian Butt.* : 296-300) gave a key for the Indian forms.

The Malaysian representatives of the *Rapala* species usually differ distinctly from the corresponding Indian and Burmese forms; although there is little tendency for the Malaysian forms to show much geographical differentiation among themselves, the Bornean race of *R. dioetas* is remarkable in that the orange-red patch of the fore-wing is obsolete. Of the Malaysian species now listed, all are now known from the Malay Peninsula, Sumatra, Java and Borneo, except that *R. subguttata* has not been recorded from Sumatra or Borneo. *R. drasmos* is known only from Malaya and Borneo, *R. rhodopsis* only from Sumatra and Borneo and *R. rhoda* only from Sumatra and Java.

I can find no satisfactory means of separating *Virachola* Mre. from *Rapala* Mre. on venation or secondary sexual characters. Nevertheless, the Indo-Malayan species which are usually placed in the former genus are more robust insects and differ somewhat in facies and it appears preferable to keep them separate pending a thorough revision of the LYCAENIDAE genera.

### Examination of the male genitalia.

In *Rapala*, the claspers are comparatively small and rather uniform in pattern, although there appears to be present a certain degree of individual and geographical variation in size and in the depth of the cleft: the posterior extremity of the large aedeagus is sufficiently distinct in some species to serve as a reliable specific character.

The claspers of *R. subguttata* are distinctive in the terminal hook, and in *R. abnormis* are narrow, cylindrical and deeply cleft. In the three allied species, *R. dioetas*, *R. dienece* and *R. drasmos*, the claspers are long, tapering and deeply cleft, while the aedeagus has a prominent thorn-like process, and the genitalia of *R. pheretima* show the same general features. *R. hades*, *R. rhoda* and *R. rhodopsis* appear to be specifically distinct, although the genitalia show no remarkable differences: *R. manea*, *R. scintilla* and *R. varuna* constitute another group showing similarity in facies and in male genitalia.

There appear to be no differences in the male genitalia corresponding to the presence or absence of a brand on the upperside of the fore-wing in *R. sphinx*. In *R. rosacea* the claspers are broader and more deeply cleft than in the allied *R. nissa*.

Key for the separation of the Malaysian species of *Rapala* Mre.

- 1 (5). Un pattern abnormal, not comprising markings as in 5.  
*subguttata* group.
- 2 (3). Un purple-brown, purple washed, with large dark spots, edged with white, and arranged as in *Arhopala* Bsdv. . . . . *subguttata*.  
*abnormis* group.
- 3 (4). Un pale ochreous with brown markings comprising a large, rounded discal spot, a broad post-discal band and a broad distal border on both wings . . . . . *abnormis*.  
*kessuma* group.
4. Un pale brown, with narrow white lines arranged as in *Jamides* Cr. . . . . *kessuma*.
5. Un pattern normal comprising a cell-end bar, post-discal band and rather indistinct submarginal band on each wing.
- 6(27). UnF post-discal band curved and more or less parallel to the distal margin.
- 7(20). Up red, reddish-brown or brown in ♂, and brown in ♀ (except *pheretima* ♀). ♂ unF with tuft at mid dorsum.  
*pheretima* group.
- 8 (9). Un with a broad bar at cell-end and in middle of cell on both wings (not always present in ♀). ♂ up brownish-red with black apical border, or dark reddish-brown. ♀ up dull, steely blue, or purple blue, shading to black at wing margins. ♂ tuft ochreous . . . *pheretima*.
9. Un without a central cell-bar on both wings.
- 10(18). Un post-discal line single, only white edged outwardly.  
*dioetas* group.
- 11(14). Un ochreous. H lobe yellow.
- 12(13). Un ochreous yellow. ♂ tuft orange-yellow. UnH black subternal spots narrowly orange crowned. ♂ up orange-red to orange-brown, with costa, termen and inner margin broadly black bordered on F (the orange-brown patch becoming obsolete in the Bornean race). ♀ up dark brown . . . . . *dioetas*.
13. Un brownish ochreous. ♂ tuft dark brown. UnH black subternal spot in space 2 broadly orange crowned. ♂ up coppery red with F broadly black bordered as in *dioetas*. ♀ up dark brown . . . *dienece*.
- 14(17). Un grey in ♂, paler grey in ♀.
- 15(16). UpH lobe yellow. UnH black spot in space 2 narrowly yellow crowned. ♂ up coppery red with broad black bordering on F as in *dienece*. ♀ up dark brown, with pale orange-brown discal patch on F, on which the veins are dark dusted . . . . . *drasmos*.  
*melampus* group.
16. UpH lobe orange-red. UnH black spot in space 2 broadly crowned with orange-red. ♂ up dull coppery red, with distal border decreasing to tornus and not continued along inner margin. ♀ up reddish-brown . . . . . *melampus*.  
*rhodopsis* group.
17. Un brown with an ochreous hue. Up dark reddish-brown, ♂ usually with dark orange-red discal areas, on which the veins are dark dusted. UnH space 1c heavily dusted with greenish-blue . . . *rhodopsis*.
18. UnF post-discal lines double, white edged on both sides.
19. Un and up coloured as in *rhodopsis*. UnH with post-discal band broken at vein 6 and upper portion moved inwards . . . . . *rhoda*.
20. Up some shade of blue in both sexes.
- 21(26). Up dull. ♂ upF with brownish stigma along veins 2, 3 and 4.

*varuna* group.

- 22(25). Un post-discal bands narrow as usual, and whitened outwardly. ♂ up dark slate blue, shot deep blue. ♀ up dull purple-blue, shading to black at wing margins.
- 23(24). Un brown to purple-brown, usually purple washed. ♂ up shot purple-blue in inner half of F and most of H; tuft pale reddish-brown. ♀ up wing bases purple *manea*.
24. Un greyish-brown, with a greenish hue in ♂, and tending to ochreous brown in ♀. ♂ upH shot blue; tuft dark brown. ♀ up wing bases greenish *scintilla*.
25. Un post-discal bands broad, white edged on both sides. ♂ up dark, shining, greenish, indigo blue, shading to a broad black apical border on F; tuft dark brown. ♀ up purple-blue, shading to black at wing margins *varuna*.
- sphinx* group.
26. Up bright shining blue. Un with very dark, broad, post-discal bands, not white edged. ♂ tuft dark brown *sphinx*.
27. UnF post-discal band straight to vein 2 and directed towards tornus.
- nissa* group.
28. Up dark steely blue, paler in ♀, with broad, black, apical border on F, sometimes with a prominent orange discal patch on F *nissa*.

*Rapala subguttata malaya* (Pendl. & Cbt.).

*Rapala subguttata* Elwes, 1892, *Proc. zool. Soc. Lond.* 1892 : 644, pl. xliv, f. 1 ♂; East Pegu.  
*Virachola malaya* Pendlebury & Corbet, 1933, *J. F.M.S. Mus.* 17 : 404; ♀, Malay Peninsula.

The only female of *R. subguttata* known to me is the holotype of *malaya* from Bukit Kutu. The male of *malaya* is described for the first time.

♂. *Upperside*. Deep violet-blue, with costal and distal borders on both wings and inner margin on hind-wing broadly shaded with brownish-black. The hind-wing oval brand, which extends below vein 6 into the cell, is dusted with green metallic scales.

*Underside*. Pale purple-brown, washed with violet. The markings, which are deep purple-brown in the upper halves, and become paler in the lower halves of the wings, are arranged as in the female : they are twice as broad as in the nominotypical form, in which the post-discal spots are obsolete on the fore-wing and in the costal half of the hind-wing.

Wing expanse 31.5 mm.

*Neallotype*. MALAY PENINSULA : Pahang, Bukit Jeriau, 4100 feet, 30.v. 1937 (C. F. Cowan). In my collection.

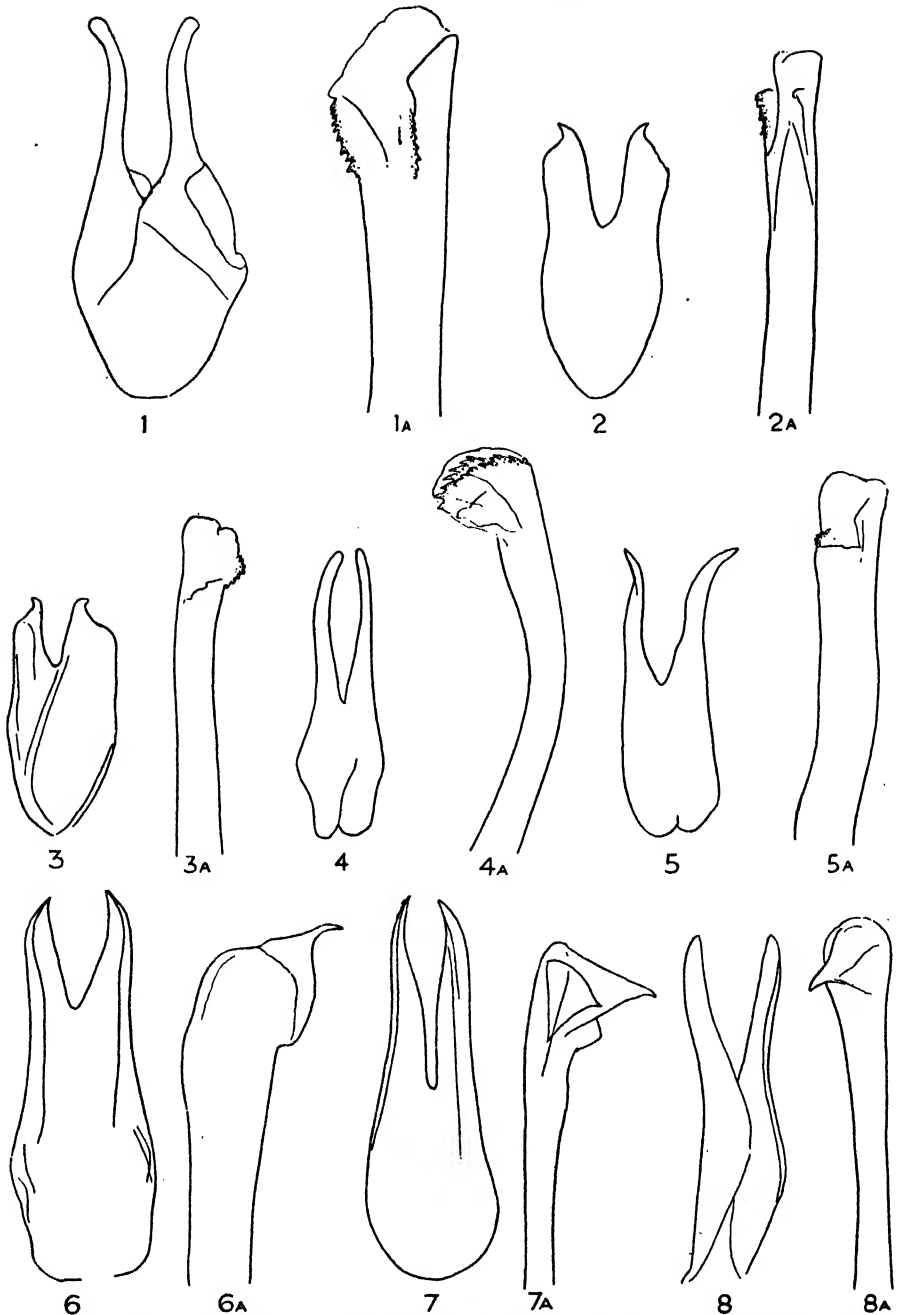
Burmese specimens from Maymyo agree with *subguttata*, but those from Tavoy are intermediate between *subguttata* and *malaya*.

The figure 127 on plate xxv in Piepers and Snellen appears to represent the male of a Javanese race of *R. subguttata*.

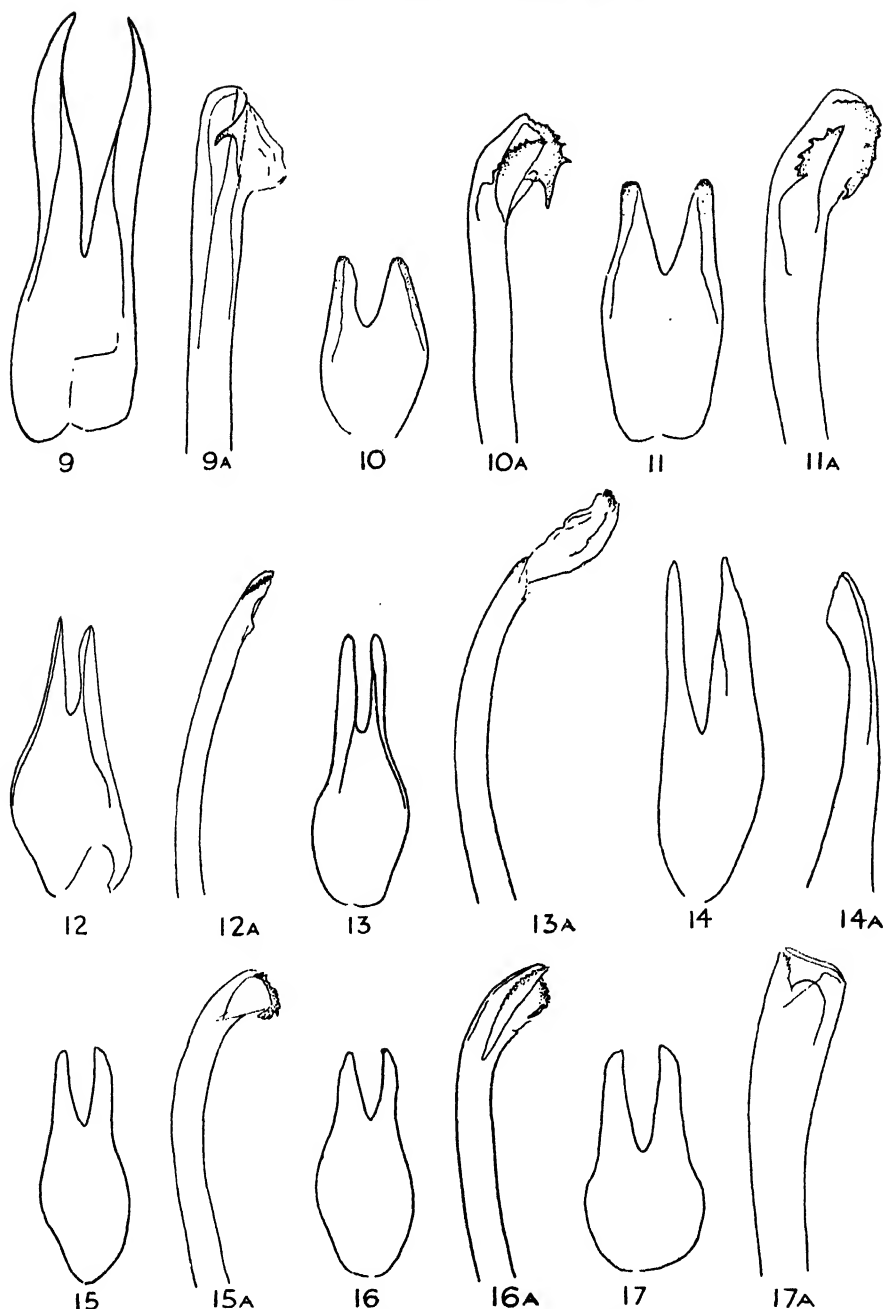
*Rapala abnormis abnormis* El.

*Rapala abnormis* Elwes, 1892, *Proc. zool. Soc. Lond.* 1892 : 642, pl. xliv, f. 2 ♂; East Pegu.  
*Rapala abnormis abnormis* Seitz, 1927, *Grossschmett. Erde* 9 : 1007.

*R. abnormis*, which is locally common on some of the hill tops in Malaya, shows little variation throughout Malaysia. The West Javanese race *abusina* Fruh. is figured in Seitz, pl. 160 d 3 und. and in Piepers and Snellen, pl. xxv, f. 136.



FIGS. 1-8.—Male claspers of (1) *Virachola perse* (Hew.) (Burma); (2) *Rapala subguttata* subguttata El. (Burma, Maymyo); (3) *R. subguttata* El. (Burma, Tavoy); (4) *R. abnormis abnormis* El. (Malaya); (5) *R. kessuma deliochus* (Hew.) (Malaya); (6) *R. pheretima sequeira* (Dist.) (Malaya); (7) *R. dioctas suffusa* (Mre.) (Burma, Mergui); (8) *R. dienece dienece* (Hew.) (Burma, Tavoy).  
 FIGS. 1a-8a.—Aedeagus of the above *Virachola* and *Rapala* forms.



FIGS. 9-17.—Male claspers of (9) *R. drasmos cowani* subsp. n. (Malaya); (10) *R. melampus melampus* (Cram.) (India, Mhow); (11) *R. melampus iarbuis* (F.) (Burma); (12) *R. rhodopsis* Nic. (Sumatra); (13) *R. rhoda sarata* Fruh. (Java); (14) *R. hades* (Nic.) (Burma, Ataran); (15) *R. manea chozeba* (Hew.) (Sumatra) holotype; (16) *R. scintilla scintilla* Nic. (Sikkim); (17) *R. varuna orseis* (Hew.) (Malaya).  
 FIGS. 9a-17a.—Aedeagus of the above *Rapala* forms.

*Rapala kessuma deliochus* (Hew.).

*Thecla kessuma* Horsfield, 1829, *Descr. Cat. Lep. Mus. E.I. Co.* : 89; ♀, Java.

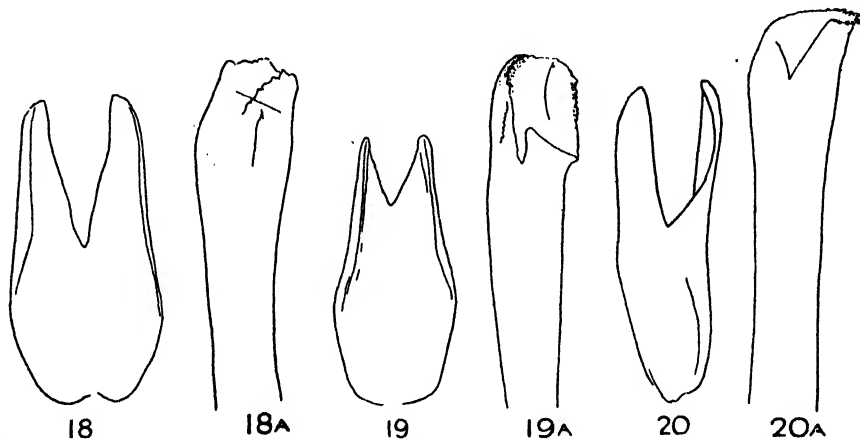
*Deudorix deliochus* Hewitson, 1874, *Trans. ent. Soc. Lond.* 1874 : 352; ♂, East India : 1878, *Ill.*

*diurn. Lep. Suppl.* : 31, pl. va, f. 68 & 69 ♂; ♂♀, East India.

*Rapala kessuma deliochus* Seitz, 1927, *Grossschmett. Erde* 9 : 1007, pl. 146B d 8 ♂ und.

In the male, the Burmese form has a more purple tone than in the Javanese race, but the difference is slight : the female is a dull, purple-blue in *deliochus* and a clear, pale greenish-blue in *kessuma*. Pendlebury (1936, *J. F.M.S. Mus.* 18 : 185) found that neither sex of Malayan *R. kessuma* differed from *deliochus*, except in the smaller size.

The nominotypical form is figured in Seitz, pl. 146 h 5 ♀, pl. 160 g 4 ♂ und., 5 ♀ und. and in Piepers and Snellen, pl. xxv, f. 126a ♂, b ♀, and the Bornean race *throana* Fruh. in Seitz, pl. 146 h 6 ♀.



FIGS. 18-20.—Male claspers of (18) *R. sphinx sphinx* (F.) (Siam); (19) *R. nissa nissoides* Swinh. (Upper Burma); (20) *R. rosacea* Nic. (Assam, Khasi).

FIGS. 18a-20a.—Aedeagus of the above *Rapala* forms.

*Rapala pheretima sequeira* (Dist.).

*Deudorix pheretima* Hewitson, 1863, *Ill. diurn. Lep. Lyc.* : 21, pl. ix, f. 27 ♀, 28 & 29 ♂; Sarawak.

*Deudorix sequeira* Distant, 1885, *Rhop. Malay.* : 278, pl. xxiii, f. 21 ♀, Malacca.

*Deudorix utimutis* Distant, 1885, *tom. cit.* : 279, pl. xxiii, f. 22 ♂; ♂♀, Malay Peninsula.

*Rapala petosiris sequeira* [sic] Seitz, 1927, *Grossschmett. Erde* 9 : 1003.

*Rapala pheretima pheretima* Seitz, 1927, *tom. cit.* : 1003 (*partim*).

*Rapala utimutis utimutis* Seitz, 1927, *tom. cit.* : 1003.

In the male of the subspecies *petosiris* (Hew.), which was described from "East India" and extends from Sikkim to South Burma (Seitz, pl. 146 b 5 ♂, 6 ♂ und., 7 ♀, 8 ♀ und.), the upperside is dull coppery red, but in the Malaysian races it is dark reddish-brown, sometimes with paler orange-brown discal patches. The middle cell spots on the underside of the female may be present or absent, and this is a further reason for the confusion existing with the nomenclature of the species.

The Bornean subspecies *phetima* (Hew.) (= *guevara* Fruh.) *syn. n.*<sup>1</sup> is

<sup>1</sup> The holotype of *guevara* is a male, and not a female as Fruhstorfer supposed. In the figure e 2 on plate 160, the pale areas on the upperside are incorrectly shown as bright coppery red, instead of dull orange-brown.

figured in Seitz, pl. 160 e 2 ♂, 3 ♂ und., 4 ♂, 5 ♂ und., and *sakaia* Fruh. (Piepers and Snellen, pl. xxv, f. 128 ♀) is the Javanese race.

*Rapala dioetas barthema* (Dist.).

*Deudoriz dioetas* Hewitson, 1863, *Ill. diurn. Lep. Lyc.* : 21, pl. vii, f. 14 ♂, 13 & 15 ♀; Celebes, Macassar.

*Deudoriz barthema* Distant, 1885, *Rhop. Malay.* : 280; ♀, Malay Peninsula.

*Rapala barthema* Seitz, 1927, *Grossschmett. Erde* 9 : 1006, pl. 160 d 4 ♀, 5 und.

The conspecificity of *dioetas* (Hew.) (Seitz, pl. 160 i 1 ♂ und., 2 ♀ und., h 9 ♂) and *suffusa* (Mre.) (Burma) has been confirmed by examination of the male genitalia. Other Malaysian subspecies are *litunia* Fruh. (= *praxaeas* Fruh.) **syn. n.**, Java (Seitz, pl. 160 h 2 ♂; Piepers and Snellen, pl. xxv, f. 134a ♂, b ♀), *laima* H. H. Drc., Kina Balu, North Borneo (Seitz, pl. 147 c 4 ♂, 160 e 1 ♂ und. as "drasmos") and *catulus* Fruh., Nias (Seitz, pl. 146 c 1 ♂, 160 h 3 ♂ und.). The female allotype of *laima* is a *R. dieneceas* form from Sarawak.

*Rapala dieneceas dieneceas* (Hew.).

*Deudoriz dieneceas* Hewitson, 1878, *Ill. diurn. Lep. Suppl.* : 31, pl. va, f. 65, 67 ♂, 66 ♀; Singapore.

*Deudoriz xenophon* Distant (nec Fabricius), 1886, *Rhop. Malay.* : 465, pl. xlv, f. 1 ♂.

*Rapala xenophon dieneceas* Seitz, 1927, *Grossschmett. Erde* 9 : 1002.

The female allotype of *dieneceas* appears to be conspecific with the male holotype, although the underside is greyer than usual in this species. The female figured by Distant represents that sex of *R. melampus*.

Two further Malaysian races described by Fruhstorfer are *mezetulus*, Java (Seitz, pl. 160 h 5 ♀ und., 6 ♂; Piepers and Snellen, pl. xxv, f. 135a ♂, b ♀) and *dazata*, Nias (Seitz, pl. 160 h 7 ♂, 8 ♂ und.).

*Rapala drasmos cowani* subsp. n.

*Rapala drasmos* H. H. Druce, 1895, *Proc. zool. Soc. Lond.* 1895 : 624, pl. xxxiv, f. 13 ♀; Labuan.

The nominotypical form is known to me only from the figure of the female which accompanies the original description : the male has remained unknown. Recently, Messrs. C. F. Cowan and J. N. Eliot obtained a series of a remarkable *Rapala* from mangrove forest on Singapore Island : the female is definitely conspecific with *R. drasmos*, and the male resembles *R. dieneceas* above but has a very distinctive underside. It may well be that *R. drasmos* is confined to the mangrove association in Malaysia, where collecting is difficult and dangerous, and this accounts for its extreme rarity in collections.<sup>2</sup> I am glad to be able to name the new subspecies after one of its discoverers.

♂. *Upperside.* Resembles *dieneceas* (Hew.) ♂, from Malaya, exactly, except that the fore-wing apex is more acute and the inner edge of the fore-wing broad, black, costal border does not pass straight through the cell, dividing it longitudinally, but entirely fills the cell from the base to the origin of vein 2, where it is upturned and reaches the distal border between veins 4 and 5. The black spot on the hind-wing lobe has only a minute yellow patch on its inner edge.

*Underside.* Plumbeous grey, surface slightly shining, and narrow cell-end bars double and only faintly indicated. The dark brown post-discal bands are narrow, outwardly faintly and narrowly edged with white; these bands are placed as in *dieneceas* but are straighter. Both wings with obscure, submarginal shading. On the hind-wing, the lower end of the stripe comprising the post-discal band in space 2 is moved outwards,

<sup>2</sup> The plant associations in Malaya are discussed in Corbet, 1935, *Biological Processes in Tropical Soils* (Cambridge) : 25, and in Corbet, 1938, *Proc. R. ent. Soc. Lond.* (C) 3 : 42,



and the upper end of the contiguous stripe in space 3 is moved inwards slightly. The large black subternal spot in space 2 is inwardly narrowly crowned with ochreous and the outer portion of space 1c is broadly dusted with bluish-grey scales. The hind-wing tail at vein 2 is slightly longer than in *dienece*. Antennae also slightly longer. Body reddish-brown above, and pale buff below. Legs black and white ringed.

Wing expanse 30.5 mm.

*Holotype*. MALAY PENINSULA: Singapore, Sungei Jurong (mangrove), 28.ix.1938 (C. F. Cowan). In British Museum. Five other males, with wing expanses up to 35 mm., are similar.

♀. *Upperside*. Dark brown, with a pale, diffuse orange-red discal patch on the fore-wing, on which the veins are dark dusted; this patch being shorter and broader than in *drasmos* ♀ from Borneo (Seitz, pl. 146B d 9 ♀). On the hind-wing, the distal area is faintly washed with orange-red and here the veins are darkened.

*Underside*. Silvery grey, with the surface more matt than in the male, and without the yellow tinge found in *drasmos* ♀. Markings as in the male, but the post-discal band is more broadly white-edged.

Body and legs as in the male.

Wing expanse 30 mm.

*Allotype*. MALAY PENINSULA: Singapore, Sungei Jurong (mangrove), 28.viii.1938 (C. F. Cowan). In British Museum. Three other females, with wing expanses up to 34 mm., differ slightly in the extent of the orange-red colouring of the upperside.

### *Rapala melampus ocerta* Fruh.

*Papilio melampus* Cramer, 1782, *Pap. Exot.* 4: 142, pl. cccxii, f. G. & H ♂; Coromandel Coast. *Deudorix jarbas* Distant (nec Fabricius), 1885, *Rhop. Malay.*: 278, pl. xxiv, f. 15 ♂, pl. xx, f. 26 ♀ (poor).

*Deudorix xenophon* Distant (nec Fabricius), 1886, *Rhop. Malay.*: pl. xlv, f. 2 ♀.

*Rapala manea ocerta* Fruhstorfer, 1911, *Berlin. ent. Z.* 56: 254; ♀, Singapore. Holotype figured by Distant, *loc. cit.*, pl. xlv, f. 2.

*Rapala melampus jarbas* Seitz (nec Fabricius), 1927, *Grossschmett. Erde* 9: 1001.

*Rapala manea ocerta* Seitz, 1927, *Grossschmett. Erde* 9: 1006.

*Rapala jarbas jarbas* Corbet & Pendlebury, 1934, *Butt. Malay. Penin.*: 205, pl. xiv, f. 203 ♂.

*R. melampus* exhibits a considerable degree of variability both as regards facies and male genitalia, but there can be no doubt that *melampus* (Cram.) and *iabus* (F.)<sup>3</sup> are conspecific. It appears as well to retain Fruhstorfer's name for the Malayan race as males from the Peninsula south of Kedah are usually of larger size than true *iabus*.

The species occurs almost unchanged throughout Malaysia, but the Javanese form has been separated as *dekaiarchus* Fruh. (Piepers and Snellen, pl. xxv, f. 133a ♂, b ♀, 139b ♀) and the Niasese race *menaichus* Fruh. is quite distinct. In the form *yabala* Fruh., East Java and North-east Sumatra, the upperside has a much browner hue.

### *Rapala rhodopsis* Nic.

*Rapala rhodopsis* de Nicéville, 1896, *J. Bombay nat. Hist. Soc.* 10: 183, pl. T, f. 41 ♂, 42 ♀; North-east Sumatra, Battak Mountains.

This species is represented in the British Museum by a few males from Sumatra and a single female from Borneo.

<sup>3</sup> *Papilio iabus* Fabricius, 1787, *Mant. Ins.* 2: 68; ♂, Siam. The name is usually misspelt "jarbas."

*Rapala rhoda* Nic.

*Rapala rhoda* de Nicéville, 1896, *J. Bombay nat. Hist. Soc.* 10 : 184, pl. T, f. 43 ♂, 44 ♀; North-east Sumatra, Battak Mountains.

This and the preceding species are quite distinct from *R. hades* (Nic.),<sup>4</sup> which is confined to Burma, and has the upperside dark brown with pale orange discal patches, on which the veins are dark dusted on the fore-wing: the male lacks a hair tuft on the dorsum on the fore-wing beneath.

The nominotypical form of *R. rhoda* is known to me only from the original figures, but the species appears to be less rare in Java, where it is represented by the subspecies *sarata* Fruh. (= *ignota* Piep. and Snell.) (Seitz, pl. 160 g 1 ♀ und., and Piepers and Snellen, pl. xxvi, f. 141 ♂).

*Rapala manea chozeba* (Hew.).

*Deudorix manea* Hewitson, 1863, *Ill. diurn. Lep. Lyc.* : 23, pl. x, f. 40 ♂, 41 ♀; Celebes.

*Deudorix chozeba* Hewitson, 1863, *tom. cit.* : 24, pl. v, f. 47 & 48 ♂; Sumatra.

*Rapala varuna chozeba* Seitz, 1927, *Grossschmett. Erde* 9 : 1004, pl. 146 c 2 ♂, 3 ♂ und. (post-discal bands rather too broad).

There is not much geographical differentiation in this widely distributed species. The Malayan form resembles *chozeba* (Hew.) in the male: I have seen no females of *chozeba* but the Malayan female has the wing bases brighter blue and the under surface more deeply purple washed than in the same sex of the Burmese race (*schistacea* Mre.) which was described from Calcutta and is figured in Seitz, pl. 146 a 4 ♂, 5 ♀, 6 ♀ und.

It has been ascertained that the following represent *R. manea* subspecies: *asikana* Fruh. (= *beluta* Fruh.), West Java (Piepers and Snellen, pl. xxv, f. 130a ♂, b ♀), *renata* Fruh., East Java, *bawcanica* Fruh., Bawean (Seitz, pl. 160 c 4 ♂, 5 ♀ und.) *ingana* Fruh., Borneo and *bandatara* Fruh., Bazilan (Seitz, pl. 160 c 6 ♂, 7 ♀ und.). The nominotypical form from the Celebes is figured in Seitz, pl. 146B g 5 ♂, 6 ♂ und.

*Rapala scintilla scintilla* Nic.

*Rapala scintilla* de Nicéville, 1890, *Butt. India, Burmah & Ceylon* 3 : 461; ♂, Sikkim.

*Rapala scintilla* Seitz, 1927, *Grossschmett. Erde* 9 : 1005, pl. 160 d 7 ♂, 8 ♀ und. (the ♂ fig. should show only the hind-wing blue shot).

Although usually Malaysian males are more fuscous above and have a greener hue, while the females lack the bright purple colour often present in the Sikkim form, some specimens from Malaya and Borneo are not separable from the nominotypical form. The Philippine race *nemana* Semp., described from East Mindanao and figured in Seitz, pl. 160 c 8 ♂, 9 ♂ und., is not very different. I have not seen the female holotype of *enganica* Fruh., Engano, which was described as a *R. manea* form, but imagine that it pertains to *R. scintilla*.

*Rapala varuna orseis* (Hew.).

*Thecla varuna* Horsfield, 1829, *Descr. Cat. Lep. Mus. E.I. Co.* : 91; ♂♀, Java.

*Deudorix orseis* Hewitson, 1863, *Ill. diurn. Lep. Lyc.* : 23; ♂, Sumatra.

*Rapala varuna orseis* Seitz, 1927, *Grossschmett. Erde* 9 : 1004.

Malayan examples are not separable from the Sumatran form. The nominotypical form is figured in Seitz, pl. 146 a 7 ♂, 8 ♂ und., 9 ♀ and in Piepers and

<sup>4</sup> *Hysudra*(?) *hades* de Nicéville, 1895, *J. Bombay nat. Hist. Soc.* 9 : 318, pl. P, f. 46 ♂; Tenasserim; 1897, *J. asiat. Soc. Bengal* 66 : 560, pl. iv, f. 29 ♀; Burma.

Snellen, pl. xxv, f. 131a ♂, b ♀, and other *R. varuna* subspecies are *grisea* (Mre.), Dehra Dun, *zulkarna* Fruh., Central Java (Seitz, 160 f. 1 ♂ und.), *sagata* Fruh., Bawean (type locality) and East Java (Seitz, pl. 146 c 2 ♀ und., and Piepers and Snellen, pl. xxv, f. 132 ♀), *saha* Fruh., Borneo and *ambasa* Fruh., Nias (Seitz, pl. 160 f 7 ♂ und.).

*Rapala sphinx rhoecus* Nic.

*Papilio sphinx* Fabricius, 1775, *Syst. Ent.* : 520; India orientali.

*Rapala rhoecus* de Nicéville, 1895, *J. Bombay nat. Hist. Soc.* 9 : 319, pl. P, f. 47 ♂; North-east Sumatra; 1896, *tom. cit.* 10 : 182, pl. T, f. 40 ♀; North-east Sumatra.

*Rapala sphinx rhoecus* Seitz, 1927, *Grossschmett. Erde* 9 : 1005, pl. 161 b 3 ♂, 4 und.

The representatives of *R. sphinx* in Malaya, Sumatra and the Philippines are remarkable for a dark, triangular discal brand on the upperside of the fore-wing, this brand being absent as a rule in the other forms. The Javanese form (Seitz, pl. 160 e 6 ♂, 7 ♀ und., and Piepers and Snellen, pl. xxv, f. 129a ♂, b ♀) hardly differs from the nominotypical form from Siam, but the Bornean race has been separated as *melida* Fruh. (Seitz, pl. 160 e 8 ♀). The Philippine subspecies *elcia* (Hew.) is figured in Seitz, pl. 146B g 7 ♂ und., 8 ♂.

*Rapala nissa pahangana* Pendl. & Cbt.

*Thecla nissa* Kollar, 1844, in Hügel, *Kaschmir* 4 : 412, pl. iv, f. 3, 4; North India, Masuri.

*Rapala nissa pahangana* Pendlebury & Corbet, 1933, *J. F.M.S. Mus.* 17 : 404; ♀, Malay Peninsula.

This species, of which form *tacola* Fruh., from Assam, is figured in Seitz, pl. 160 g 6 ♂, is very rare throughout Malaysia: it is represented by *palamera* Fruh., Sumatra (Seitz, pl. 160 g 8 ♀) and *odosia* Fruh., Java, in the Sunda Islands.

Judging by the difference in the male clasper, *R. rosacea* Nic.<sup>5</sup> (Sikkim to Assam), with a deep rosy pink underside, is a distinct, although closely allied, species, which may be confused with faintly marked *R. subguttata* from the same localities.

The types of all the *Rapala* forms mentioned in this paper are in the British Museum, except *sphinx* F., *drasmos* H. H. Dr., *enganica* Fruh., *sarata* Fruh., and those forms described by Cramer, Kollar, de Nicéville, Piepers and Snellen and Semper. In the case of *barthema* Dist., however, only a syntype is present.

I am indebted to the Trustees of the British Museum (Natural History) for granting facilities for the study of their collections, and to Mr. H. M. Pendlebury, Director of F.M.S. Museums, and Messrs. C. F. Cowan and J. N. Eliot for the loan of specimens from their remarkably complete collections.

<sup>5</sup> *Rapala rosacea* de Nicéville, 1888, *J. asiat. Soc. Bengal* 57 : 285, pl. xiv, f. 12 ♂; ♂♀, Sikkim.

# A REMARKABLE FLY FROM AN ANTS' NEST IN NEW ZEALAND (DIPT., CHLOROPIDAE)

By J. T. SALMON, M.Sc.

(Dominion Museum, New Zealand.)

Communicated by Dr. W. R. B. OLIVER, F.R.E.S.

THE first specimen of the fly described herein was sent to me by Mr. W. E. Moore, of Christchurch, during February, 1938. Later, in the following April, in response to my request, Mr. Moore found and forwarded a further specimen. Both specimens came from the Mount Grey Valley, each from a separate nest of the ant *Monomorium integrum* Forel.

There seems to be little doubt that the fly actually inhabits the ants' nest. In a letter to me the collector states: "The first specimen was taken in the

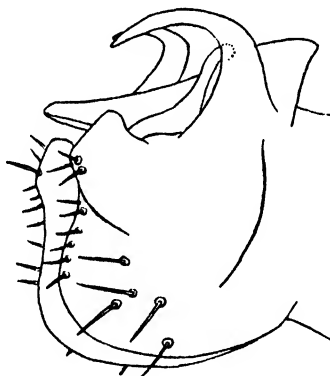


FIG. 1.—View of hypopygium from side and slightly to the rear.

middle of a large number of *Monomorium integrum*." Concerning the collecting of the second specimen he says: "On finding the nest I cut round it with a knife and lifted it entire, with as little superfluous turf as possible. The fly must have been in the nest or its immediate surroundings."

I take this opportunity to acknowledge valuable help given to me in the placing of this fly by Mr. A. L. Tonnoir, of the Division of Economic Entomology, Australian Council of Scientific and Industrial Research, Canberra.

The fly is most conveniently placed in the CHLOROPIDAE, and falls into the sub-family OSCINELLINAE. It does not, however, fall naturally into any known genus; and I propose to erect a new genus *Apterosoma* for its reception.

## *Apterosoma* gen. n.

This genus, on account of its sub-apterous condition and well-developed head chaetotaxy, might be related to *Apteroscinis* Mall., on the one hand, and to *Lasiosina* Beck. on the other. It differs, however, from these in the absence of both the mesonotal furrows and the sensory area on the hind tibia.

*Genotype* : the following species :—

***Apterosoma moorei* sp. n.**

*Male*. The general colour ochreous yellow, frontal triangle shining dark-ochreous, ocellar triangle slightly darker. Mesonotum with prominent dark-brown stripe tapering posteriorly and two broken, irregular stripes one on each side extending on to the margin of the scutellum. Abdomen, ochreous yellow, free of markings. Legs ochreous yellow. Eyes brick-red. Wings rudimentary and very small, hyaline. Halteres extremely small and reddish-brown. Body and legs evenly clothed with bristles, all bristles dark brown. Arista of antennae finely pubescent and dark brown in colour. Hypopygium small but its various parts well developed, the claspers and unci particularly so. (See fig. 1.) Length of body 1.5 mm.

*Chaetotaxy of head*. One inner and one outer vertical bristle to each side, two post-verticals, two ocellar, two large and four small fronto-orbital to each side. Numerous irregular small frontal bristles. Facial, vibrissal, and postorbital all absent.

*Chaetotaxy of thorax*. Two humeral, two notopleural, two supraalar, one intraalar, four scutellar, four irregularly-defined rows of small dorso-central and acrostical. All others absent. There are four large strong bristles arising from the costa of each wing rudiment around its base.

Holotype and paratype, male, in the Dominion Museum, New Zealand. Female unknown.

ON A NEW AND SOME LITTLE KNOWN EUROPEAN SPECIES OF  
*ARGE* SCHR. (HYMENOPTERA SYMPHYTA)

By Robert B. BENSON, M.A., F.R.E.S.

(Department of Entomology, British Museum (Natural History), London.)

WHILE investigating the high-mountain hymenopterous fauna in Valais, Switzerland, in June 1935, my wife and I collected two forms of *Arge* Schrank then unknown to me; one of these has since proved to be a new species related to *A. tergestina* (Kriechbaumer) and the other to be *A. alpina* (Konow) which is here treated as a subspecies of *A. nigripes* (Retz.).

I am much indebted to Dr. von Rosen of the Zoologische Sammlung des Bayerischen Staates, München, for the loan of the types of *Hylotoma tergestina* Kriechbaumer and also to Dr. V. V. Gussakovsky of Leningrad for representatives of various asiatic species otherwise unknown to me.

***Arge stecki* sp. n.<sup>1</sup>**

♀. *Colour* : Head and thorax with appendages bluish-black, with fuscous pubescence; abdomen yellow except for the 1st and 2nd terga which are infusate and the sawsheath which is black. Wings deeply infusate, especially at base of fore-wing, with black stigma, costa and venation.

*Length* : 7.0 mm.; antenna 2.0 mm.

<sup>1</sup> Dedicated to the late Dr. Th. Steck, Librarian at Berne, Switzerland, and student of Swiss Hymenoptera, who guided us and accompanied us during part of our stay in Switzerland in 1935.

*Head* strongly swollen behind the eyes; mouth-parts normal; maxillary palp about 1 mm. long with the 4 apical segments almost equal in length; supraclypeal area semi-cylindrical without definite medial carina; median fovea rather shallow with strong lateral carinae; eyes small (about 0.40 mm.  $\times$  0.75 mm.); the smaller dimension less than 3 times greater than the length of the malar space which is longer than the 2nd antennal segment; posterior ocelli closer together than the distance between an ocellus and the eye margin (POL:OOL as 14:17); antenna subclavate and very short, being only about as long as the breadth of the head behind the eyes (fig. 7). *Wings* with 3rd transverse cubital vein but slightly diverging above from the second, so that the 3rd cubital cell is slightly longer above than below, and below is about twice as long as the 2nd cubital vein. *Hind* legs with basitarsus not longer than two following tarsal segments together; the 2nd tarsal segment longer than the apical one; ♀ sawsheath as in *A. pagana* (Panz.); saw (figs. 1 and 4).

♂ differs from ♀ in that the abdomen is black above except at the sides and on the apical tergum, and that the eyes are slightly larger with their smaller dimension about 3 times as long as the malar space, and the antenna is about  $1\frac{1}{2}$  times the breadth of the head (3.5 mm.) and normal in form.

SWITZERLAND: Valais, Val d'Hérens, Ferpècle, 6000 ft. 1 ♀ (holotype), 14.vi.1935, and 1 ♂ (allotype), 21-27.vi.1935 (*R. B. Benson*) (British Museum).

This species is very closely related to *A. tergestina* (Kriechbaumer) from Italy, together with which it differs from all other *Arge* known to me by its very short subclavate antennae in the ♀. *A. tergestina* (Kriechbaumer, 1877) was arbitrarily and quite wrongly placed by Konow (1905) as a synonym of *A. pagana* (Panzer) from which species it is abundantly distinct, as can be seen in the original description. Such arbitrary synonymy was the usual practice in the works of Konow; many species described by other authors were not accepted by Konow unless he had specimens in his own collection, but were placed by him as synonyms of the nearest common species. In this way he was able to keep the field clear for his rapid and extremely useful (though incomplete) revisions of species.

*A. stecki* sp. n. and *A. tergestina* (Kriechbaumer) would both run down in Enslin's Monograph to couplet 21, containing *A. pagana* (Panzer) and *A. fuscipennis* (H.-S.). These four species and one subspecies can be separated as follows:—

- 1(4) Malar space shorter than 2nd antennal segment (less than  $\frac{1}{2}$  the smaller dimension of the eye); supraclypeal area, with a medial carina above; ♀ flagellum scarcely  $\frac{1}{2}$  thicker in its thickest part than at its base and the whole antenna is about  $1\frac{1}{2}$  times as long as the breadth of the head behind the eyes (fig. 8). ♀ sawsheath not fuscous at apex and the saw has large backwardly projecting teeth from the side ridges of each segment (fig. VI in Servadei 1934).

[Hind basitarsus equal in length to next 3 tarsal segments together; POL less than OOL; 3rd cubital cell of fore-wing much wider above than below, the 3rd transverse cubital vein being directed almost towards the apex of the radial cell.]

- 2(3) Fore-wings densely smoky at base but less so at apex and on hind-wings; head, thorax and legs entirely black.

All Europe (except Britain) and northern Asia to Kamtchatka

*pagana pagana* (Panzer).

- 3(2) Wings uniformly and slightly smoky; labrum, pronotum, sides of mesonotal lobes, upper parts of mesopleura, middle and hind coxae, femora and tibiae marked with yellow.

- South of England. . . . . *pagana stephensi* (Leach).
- 4(1) Malar space longer, usually much longer than the 2nd antennal segment (more than  $\frac{1}{3}$  the smaller dimension of the eye); supraclypeal area without a definite medial carina above; ♀ antenna subclavate and either only as long as the breadth of the head behind the eyes or with the flagellum at least  $1\frac{1}{2}$  times thicker at its thickest part than at its base; ♀ sawsheath fuscous at its apex and saw without backwardly projecting teeth from its lateral ridges (cf. fig. 1).
- 5(6) Hind basitarsus equal in length to the 3 following tarsal segments together; 2nd tarsal segment shorter than the apical one; tibiae and tarsi all yellow; ♀ antenna  $1\frac{1}{2}$  times as long as breadth of the head behind the eyes (fig. 9); fore-wings usually with a darker blotch below the stigma.
- [3rd transverse cubital vein in fore-wing parallel with 2nd; 3rd cubital cell below about twice as long as 2nd transverse cubital vein; POL less than OOL. 8.0-11.0 mm. Central and South-Eastern Europe]
- fuscipennis* (H.-S.).
- 6(5) Hind basitarsus equal to the 2 following tarsal segments together; 2nd tarsal segment longer than apical one; tibiae, at least in part and usually entirely, and tarsi entirely black; ♀ antenna equal in length to breadth of head behind the eyes (fig. 7); fore-wings without a darker blotch below the stigma.
- 7(8) 3rd cubital cell of fore-wing not longer above than below and scarcely longer than 2nd transverse cubital vein; POL = OOL; saw fig. 3. 8.0-9.5 mm.
- Istria (Italy). . . . . *tergestina* (Kriechbaumer).
- 8(7) 3rd cubital cell longer above than below and twice as long below as the 2nd transverse cubital vein; POL less than OOL; saw fig. 4. 7.0 mm.
- Mountains of Switzerland. . . . . *stecki* sp. n.

*Arge nigripes alpina* (Konow) (new combination).

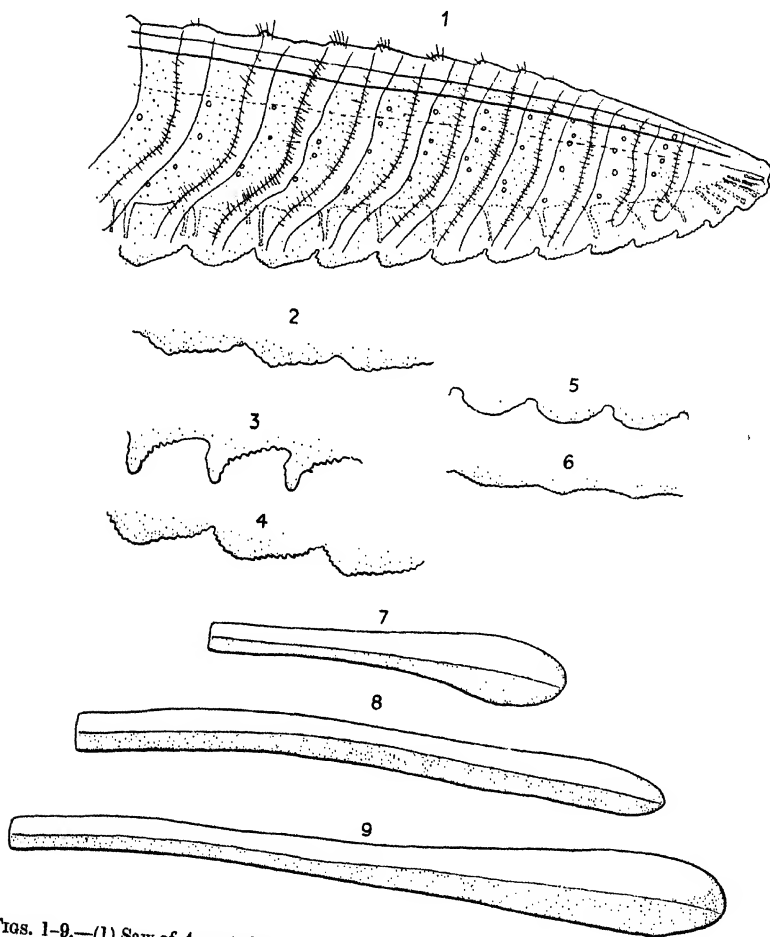
A series of a black-bodied *Arge* with entirely hyaline wings was swept in boggy mountain pastures about Les Haudères in Valais, Switzerland, at 4000-5000 ft., from 6-27.vi.1935. These were at first thought to be a peculiar form of *A. ciliaris* (L.) differing from the normal representatives of this species by the long 3rd cubital cell in the fore-wings and the almost entirely piceous legs. A study of the saws showed that they differed markedly in the shape of the teeth from those of *A. ciliaris* (L.) but were indistinguishable from those of the *ustulata-fuscipes-nigripes* complex (figs. 5 and 6); they agreed with *A. nigripes* (Retzius) in the narrower form of sawsheath than occurs in *ustulata* (L.) and *fuscipes* (Fallén) and apparently represent a hyaline-winged alpine subspecies of *A. nigripes* (Retzius). The form was described as a species *A. alpina* by Konow and wrongly placed by Enslin (p. 602) as a variety of *A. fuscipes* (Fallén).

In 12 ♀♀ and 1 ♂ of my series the pubescence on the head and thorax is silvery white, while in 2 ♀♀ and 6 ♂♂ it is fuscous as in the smoky-winged forms of *A. nigripes* (Retzius); the wings are entirely hyaline except for a small spot at the extreme base of the radial cell of the fore-wing under the stigma.

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FIGS. 1-9.—(1) Saw of *Arge stecki* sp. n. 2-6, 9th, 10th and 11th teeth from apex of saw in : (2) *Arge fuscipennis* (H.-S.); (3) *A. tergestina* (Kriechbaumer); (4) *A. stecki* sp. n.; (5) *A. ciliaris* (L.); (6) *A. nigripes* (Retz.). 7-9, Left ♀ antenna viewed from in front with pubescence omitted, in : (7) *Arge stecki* sp. n.; (8) *A. pagana* (Panzer); (9) *A. fuscipennis* (H.-S.).



## NEW SPECIES OF OLD WORLD ENDOMYCHIDAE (COLEOPTERA)

By H. F. STROHECKER.

(Kenyon College.)

Communicated by Dr. O. W. RICHARDS, F.R.E.S.

IN 1938 I acquired by purchase a collection of ENDOMYCHIDAE from O. E. Janson. Included in the lot were: a specimen of *Trycherus bifasciatus* labelled "Gerst. type"; the writing is apparently Gorham's; a specimen of *Amphix femoralis* similarly labelled; a specimen of *A. humeralis* labelled "Bates type"; a specimen of *A. discoideus* labelled "Gerst. type." This last has the status of a neotype.

In amalgamating this collection with that already in my care I have encountered, in both lots, material representing species apparently undescribed. In two instances the specimens are of recorded forms but in each instance the diagnosis was insufficient.

The types and paratypes are in my collection at Kenyon College, Gambier, Ohio.

**Eumorphus arrowi** sp. n.

*E. quadriguttato* similis, niger, nitidus; singulo elytro maculis duabus flavis ornato, his fere rotundatis, paulo transversis; pronoto subquadrato, lateribus ad basim leviter sinuatis, angulis posticis acutis; pronoto elytrisque minutissime et sparsim punctatis.

♂. Tibia antica dente interno nullo, ad apicem leviter sinuata; tibia media ad tertium medium dente parvo instructa, versus apicem valde incurvata; tibia postica fere recta; segmento ventrali ultimo spatio laeve elevato longitudine posito, utrinque ciliato, postice excavato; pronoti angulis posticis acute sed breviter productis.

♀. Segmento ventrali ultimo postice rotundate exciso.

Long. 10.0-11.5 mm., lat. 5.0 mm.

Male type, female allotype and four female paratypes bearing the label "Sangir." Another female from Gilolo is referred to this species.

In its general structure and appearance this form is to be referred to the *quadriguttatus* group of the genus *Eumorphus*. It is set apart by the lack of a tooth on the front tibia of the male but this may represent an abnormal condition inasmuch as occasional specimens of other species show the same lack. The smooth elevation on the last ventral segment of the male is also a peculiar feature. The general conformation of the male aedeagus is similar to that of *quadriguttatus* but the lateral spine is shorter, stouter and sharply angulated on its inner edge (fig. 6). The female may be distinguished from the same sex of *quadriguttatus* by the shallower and not at all angulate excision of the last ventral segment. In both sexes the pronotum and elytra are strongly shining; the punctures, even under high magnification ( $\times 48$ ) appear minute and sparse. The species is dedicated to Mr. G. J. Arrow in appreciation of his valuable studies on the Endomychids.

**Eumorphus rejectus** sp. n.

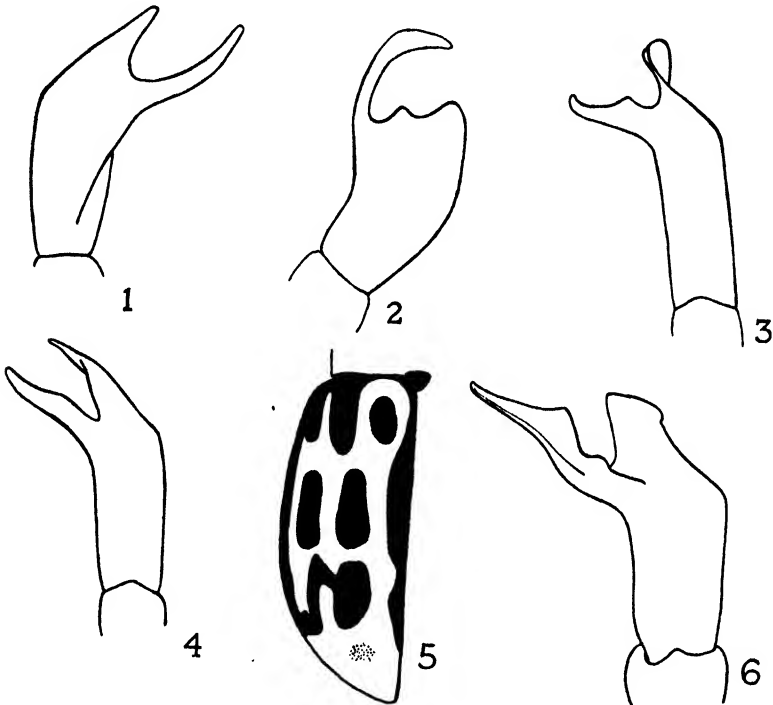
*Eumorphus murrayi* Gorham, 1896, *Ann. Mus. civ. Genova* 16: 294 (nec Gorham, 1874).  
*Eumorphus sanguinipes* Arrow, 1925, *Fauna Br. India, Endomychidae*: 304.

Niger vel nigro-violaceus, nitidus; elytro singulo maculis duabus transversis laete flavis; femoribus versus apicem rufis; pronoto elytrisque minute et obsolete punctatis.

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♂. Tibia antica ad medium dente magno gerente; tibia media dente nullo, leviter curvata; tibia postica recta, ad apicem intus profunde excisa; segmento ventrali ultimo late v-exciso; segmento dorsali ultimo integro.

Long. 11.0 mm., lat. 5.5 mm.



FIGS. 1-6.—1. ♂ aedeagus, *Eumorphus sanguinipes* Guér. 2. ♂ aedeagus, *E. rejectus* sp. n., type. 3. ♂ aedeagus, *Indalmus (Ancylopus) graphicus* Gorham. 4. ♂ aedeagus, *Indalmus gorhami* sp. n., type. 5. Elytral pattern of *Trycherus maculatus* sp. n., type. 6. ♂ aedeagus, *Eumorphus arrowi* sp. n., type.

Five specimens taken by *L. Fea*, bearing the label "Carin Cheba, 900-1100m. v-xii-88."

These specimens are undoubtedly from the series referred to by Gorham in 1896 and by Arrow in 1925. The species bears a strong resemblance to *E. sanguinipes* Guérin but may be distinguished by the straight hind tibia, inwardly excised at the tip (male) and by the almost parallel sides and decidedly acute hind angles of the thorax (both sexes). In *sanguinipes* (specimens det. Arrow) the sides of the thorax curve inward at the apex and the hind angles are right or slightly acute. The aedeagi of males of the two species show strong dissimilarity (figs. 1 & 2).

#### *Indalmus gorhami* sp. n.

*Ancylopus graphicus*, var. Gorham, 1873, *Endomycici Recitati*, Cat. *Endomycici*: 41.

"Elytris fuscis, annulo humerali, extus angulato, ac lunula ante apicem flavis, thorace etiam interdum binotata, ♂♀" (Gorham).

There are before me five specimens of *graphicus* from Joko and Jaunde, Cameroons, and six specimens of the new species from the same localities. It is easy to understand how Gorham supposed the latter to represent individuals of *graphicus* with a greater development of black on the elytra. The male aedeagi of the two forms are abundantly distinct (figs. 3 & 4). In the male of *graphicus* the tooth on the fore tibia is nearer the apex than in *gorhami*. From the short series at hand it appears that the colour patterns are adequate for distinguishing the two.

***Pseudindalmus biguttatus* sp. n.**

Latus, valde depressus, totaliter glaber, nitidus; pronoto rufo, lateribus versus basim paulo convergentibus, angulis posticis fere rectis vel parum acutis; elytro singulo ad tertium posterius guttam magnam rufam gerente, hac excepta nigro; subtus, elytrorum epipleuris exceptis, rufus, glaber, nitidus.

♂. Tibia antica ad basim valde curvata, infra medium intus angulariter dilatata; antennarum articulo 9 quam 10 paulo majore; segmento ventrali ultimo late emarginato. Long. 8.0 mm., lat. 3.5 mm.

*Type*: one specimen bearing the label "Sangir."

Of the known species of the genus this is the only one in which the elytral markings consist of only two spots. These are placed on the posterior third and extend from near the margin almost to the suture; the tips of the elytra are black.

***Trycherus maculatus* sp. n. (fig. 5).**

Flavo-rufus, vix nitidus; pronoto rufo, maculis duabus et area post lineam basalem nigris; elytris valde convexis, singuli sutura, margine externo (quarto ultimo excepto), macula angulata humerali, scutello, macula media basali, strigis duabus brevibus latisque mediis et macula posteriore ad marginem in linea angulata attingente, nigris, apice laeto; subtus piceus; antennis pedibusque nigris; pronoto elytrisque fortissime punctatis.

Long. 9.0 mm., lat. 4.5 mm.

One female specimen (type) bearing the label "Ofudedc, N. Nigeria." I have not hesitated to describe this species from a female specimen because of its unusual habitus; indeed it may prove the type of a new genus, but in its general characters it resembles the species of the genus *Trycherus*.

The mandibles are much worn but show an apical cleft; the inner tooth is very stout and blunt. On its outer edge the mandible is sinuate near the tip. The puncturing of the upper surface is much coarser than in other species of *Trycherus* and the elytral markings are wholly unlike those of any other species of the genus. The last segment of the labial palp is transverse, the prosternum moderately broad and prolonged behind the front coxae. The antennae are rather stout and short but not more so than in *T. tricolor* Gerst. The margins of the pronotum are fine, the basal groove broad and deep, the lateral foveae deeply impressed, parallel and reaching almost to the middle of the disc.

A NEW SPECIES OF *ORTHOPODOMYIA* (DIPTERA CULICIDAE)

By F. W. EDWARDS, F.R.S., F.R.E.S.

INCLUDED in a fine collection of Costa Rican mosquitoes recently received from Dr. H. W. Kumm (through Prof. P. A. Buxton) was a series of a species of *Orthopodomyia* which the collector had provisionally determined as *O. albicosta* (Lutz). Comparison with specimens in the British Museum, however, showed that the species has much more resemblance to the North American *O. signifera* (Coq.) than to the South American *O. albicosta*, but is amply distinct from both; it is also evidently distinct from the Jamaican *O. waverleyi* (Graham) which according to the original description, and the redescription by Howard, Dyar and Knab, seems more likely to be a distinct species than a synonym of *O. signifera*.

The new species is described below as *O. kummi*, in honour of the collector, and a key is appended to the known species of the *Bancroftia* group, *i.e.* those species of *Orthopodomyia* which have the mesonotum adorned with narrow white lines (excluding *O. phyllozoa* (D. & K.) which has quite a different type of ornamentation).

***Orthopodomyia kummi* sp. n.**

♀. *Head* black, erect scales and bristles black; a line of pure white scales bordering eyes and a patch of decumbent white scales on nape. Proboscis black, with numerous scattered white scales but without a white ring. Palpi with scattered white scales and narrow white tip, as usual rather more than one-third length of proboscis. Antennae with a line of white scales dorsally extending whole length of first six segments. *Thorax* black, mesonotum with six narrow lines of white scales as shown in the figure; the posterior pair of lines are very slightly broken at the point where they begin to converge, and the long scales on the margin of the scutellum which form the posterior ends of these lines are about as long as the scutellum. A line of white scales crosses anterior and posterior pronotal lobes, continuing the white line of the head. Another line of white scales, of even width throughout, extends from base of prosternum to posterior edge of mesepimeron. A short line of white scales extends along posterior edge of lower half of sternopleura. Mesonotal bristles numerous and black; numerous small black scales cover much of the surface between the white lines. (This ornamentation of the thorax is very much the same as in *O. signifera*, except that in that species the white scales on the sternopleura are more numerous and form less definite lines.) *Abdomen* with integument of first two segments brownish, rest darker, scales mainly black; a large white median triangle at base of second tergite, following tergites with smaller median basal pale spots, well separated from the lateral pale spots. Venter mainly dark. *Legs* black; femora and tibiae with numerous white scales, which tend to form lines on anterior surfaces of mid and hind tibiae. Tarsi without scattered white scales; front tarsi all dark; middle tarsi with a white ring at base and a small white spot at joint 1-2; hind tarsi with white ring at base and with four other white rings or bands which are hardly complete beneath, those on joints 1-2 and 2-3 broad; fifth segment white above. *Wings* with the scales narrower than in *O. signifera* and mostly black; a line of white scales on *R* from base to base of *Rs*, and a few scattered white scales on *Sc* and *R1* beyond this.

♂. Resembles ♀ except that the abdominal tergites have complete basal white bands. Palpi straight, slender, equalling proboscis in length. Wing-length 4–5 mm.

COSTA RICA : Orosi, vi.1937 (*H. W. Kumm*). Type ♀, paratypes 4 ♂♂ 3 ♀♀ in British Museum; others in London School of Hygiene and Tropical Medicine.

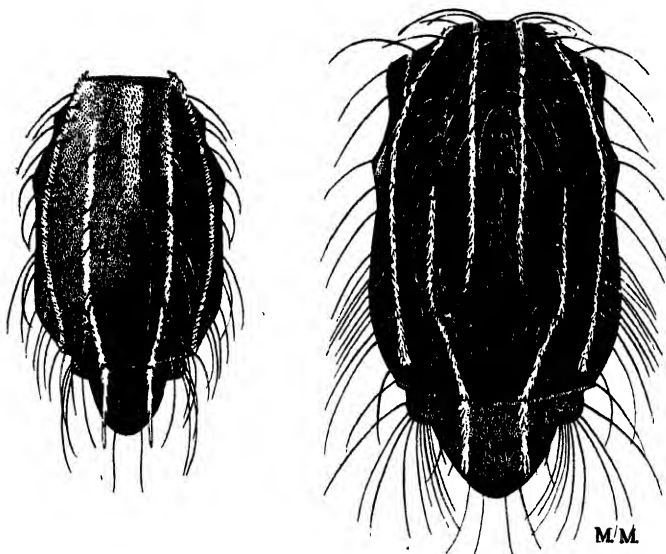


FIG. 1.—Thoracic ornamentation of *Orthopodomyia*: Left, *O. albicosta* (Lutz); right, *O. kummi* sp. n.

Key to species of *Orthopodomyia* (*Bancroftia* group).

1. Thorax dark reddish-brown; mesonotum with only four narrow white lines, surface largely bare but with three stripes of brown scales, accompanying the dorso-central and acrostichal bristles; long white scales on margin of scutellum much longer than scutellum; abdominal tergites all dark above (♂♀); hind femur and tibia with conspicuous white anterior lines; ♂ palpi shorter than proboscis; flagellum of ♀ antenna without scales; wings dark except for a line of white scales on *R* (Brazil, Venezuela) *albicosta* (Lutz).
2. Thorax blackish; mesonotum with six or eight narrow white lines, surface mainly covered with small blackish scales; long white scales on margin of scutellum about as long as scutellum; abdominal tergites with basal white spots or bands; legs less obviously lined with white; ♂ palpi about as long as proboscis . . . . . 2.
2. Mesonotum on posterior half with two pairs of white lines between the marginal lines, the outer pair straight and extending back to scutellum; proboscis dark, with a narrow white ring beyond middle; wing-scales not very broad, black, with a short white line at base of *R*; antennal flagellum of ♀ without scales (Europe) . . . . . *pulchripalpis* Rond.
- Mesonotum and wings otherwise; proboscis with white scales tending to form lines, but without white ring (America) . . . . . 3.

3. Mesonotum on posterior half with a pair of short curved white lines which are quite disconnected from the convergent pair which cross the scutellum (Jamaica) . . . . . *waverleyi* (Graham).  
 Mesonotum on posterior half with a pair of short straight lines which are almost continuous with the convergent pair which cross the scutellum; antennal flagellum of ♀ with a line of white scales above extending along first five or six segments . . . . . 4.
4. Wing scales narrower and mostly blackish, a long white line on *R*; abdominal tergites unbanded in ♀ (Costa Rica) . . . . . *kummi* sp. n.  
 Wing-scales broader, mixed black and white, no white line on *R* but a white patch over cross-veins; abdominal tergites banded (♂♀) (U.S.A.) . . . . . 5.
5. Second abdominal tergite with a complete dark band posteriorly *signifera* (Coq.).  
 Second abdominal tergite mainly white, the dark posterior band interrupted in middle . . . . . *alba* Baker.

## AFRICAN BEES OF THE GENUS *NOMIA* (HYMEN.)

By T. D. A. COCKERELL, F.R.E.S.

(*University of Colorado.*)

THE bees recorded in this paper will be found in the collection of the British Museum, excepting *N. wallacei*, which is at Oxford.

(A.) The following species of *Nomia* have the tegulae small, or not much enlarged.

### *Nomia clavigera* sp. n.

♂. Length about 6.0 mm., anterior wing 5.4; black, with a strongly clavate abdomen, broad and rounded in middle, greatly narrowed at base; head rather broader than long; face densely covered with pale yellowish hair; mandibles red except basally; flagellum long, dull red beneath; vertex entirely dull; thorax with pale greyish hair on margin of pronotum, tubercles, pleura and postscutellum; mesonotum dull, a little shining on disc; the notauli conspicuous as shining lines; scutellum shining, especially in front; area of metathorax basally dull and rugose, posteriorly shining; posterior truncation dull; tegulae very dark brown, not enlarged; wings very long, basally hyaline, the apical part strongly dusky; stigma dark brown, nervures brown; second cubital cell receiving recurrent nervure about middle; legs simple, black, the tarsi brownish, hind femora rather stout; abdomen dullish, except the shining brownish hind margins of tergites; tergites 2 to 5 with apical bands of white hair, broadly interrupted on second and third; fourth sternite mainly covered with light red tomentum.

CAPE PROVINCE: Upington, alt. 2800 ft., 21.ii.1934 (*L. Ogilvie*). Related to *N. ekuvivensis* Ckll., from Benguela, but considerably smaller, and differing in various details of coloration. Another related species is *N. clavata* (Smith), from Sierra Leone (*Morgan*), which has the face narrow, inner orbits concave above. It was described under *Halictus* in 1853.

### *Nomia wallacei* nom. n.

*Nomia clavata* Smith, 1861, nec *Halictus clavatus* Smith, 1853.

Gilolo, Moluccas. I have examined the type, which is at Oxford.

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**Nomia laticinctula** sp. n.

♀. Length 8.0 mm., anterior wing nearly 6.0; black, including legs, except that the tarsi are red at apex, and in the type the front and middle knees are bright red, but this is not apparent in some other specimens; head broad, the face covered with creamy-white hair, not distinctly yellow; mandibles red in middle; flagellum red beneath; vertex dull; hair of thorax creamy-white, but distinctly fulvous on scutellum and hind border of mesonotum; mesonotum closely punctured, but shining on disc; scutellum very hairy, a little shining on disc; postscutellum with dense creamy-white tomentum; channel at base of metathorax rather broad, glistening with fine but very distinct plicae; the area is triangular, pointed behind; tegulae moderately large, pale testaceous, translucent; wings yellowish hyaline, with very pale reddish stigma and nervures; second cubital cell broad, receiving recurrent nervure beyond middle; hind tibiae anteriorly with abundant silvery white hair; abdomen dull, first tergite with a pallid margin, or it may be all dark, at sides with some white hair; second tergite with a thin and rather narrow fulvous hair-band; tergites 3 to 5 with very broad bands of dense fulvous tomentum, the apex coloured the same; venter with much glittering pale hair.

S.W. AFRICA: Otavi, 24-26.xii.1933, many specimens (*J. Ogilvie*, *L. Ogilvie*). Superficially similar to *N. emicata* Ckll., which has a quite different base of metathorax, and the face not covered with hair. There is some resemblance to *N. somereni* Ckll., which has red legs. In my 1935 table it could run near *N. opacibasis* Ckll. or *N. umbiloensis* Ckll., but is quite distinct from both. The first tergite is moderately shining, and it would run to *N. nitidibasis* Ckll. in my Natal table (1920), but that is a much larger species.

**Nomia opacibasis sublucens** subsp. n.

♀. Differs by the shining mesonotum, with very distinct punctures; second tergite more strongly punctured, white hair-band on third narrower, apical part of fourth with little pale hair. The legs are black, with front and middle knees red, and tarsi red at end. The red hair at end of abdomen is exactly as in the much larger *N. pyrura* Ckll. The scutellum is dull.

BECHUANALAND: Palapye Road (type locality), 8 ♀♀, 4-6.iii.1934 (*J. Ogilvie*, *L. Ogilvie*). S.W. AFRICA: Otavi, 1 ♀, 27.xii.1933 (*J. Ogilvie*). A rather weak race, but distinguishable.

**Nomia matophila** sp. n.

♀. Length 7.3 mm., anterior wing 7.2 mm.; black, robust, with oval abdomen; mandibles black; the stout flagellum red beneath, and at extreme tip above; hair of head and thorax greyish-white; head broad; face with thin hair; clypeus dull and very densely punctured, the upper margin shining; vertex moderately shining; mesonotum polished with fine punctures; scutellum shining, not bigibbous, not hairy; a rather broad band of pale hair along hind margin of mesonotum, the usual hair on axillae, and postscutellum densely covered with pale tomentum; area of metathorax with very fine regular plicae, the area a narrow band at sides, but in middle produced downward to an acute angle; tegulae fulvous, dark at base, not enlarged; wings very ample, dusky hyaline, not darker at apex; stigma very large, pale red; nervures pale brown; second cubital cell about square, receiving recurrent nervure about middle; legs black, only the tips of the tarsi red; underside of hind tibiae with long silvery hairs; abdomen moderately shining, but not polished; first tergite with a white hair-band, broad at sides, linear in middle; tergites 2 to 4 with rather broad bands of white hair; margin of fifth faintly reddish.

S. RHODESIA : Matopo Hills, 17-30.iv.1932 (*Alice Mackie*). Related to *N. albidula* Friese, which has the fifth tergite dark-haired, and also to *N. seminitens* Ckll. In Strand's table it runs to *N. halictiella* Strand (*N. pseudohalictiella* Strand), which has different legs.

***Nomia gobabica* sp. n.**

♀. Length about 7.0 mm., anterior wing 6.2; black, robust, with long-oval abdomen; mandibles red in middle; flagellum bright red beneath; hair of head and thorax white, dense and pure silvery-white on face, dense on postscutellum and axillary marks, but no band on hind border of mesonotum; head broad, quite large; clypeus dull; a shining line along lower edge of supraclypeal area; vertex hardly shining, the occipital margin very near to ocelli; mesonotum and scutellum shining, not evidently hairy; scutellum with a median groove; area of metathorax broadly triangular, narrow at sides, with minute plicae; tegulae testaceous with dark base, and outer margin hyaline and colourless; wings clear, very faintly dusky apically; stigma small, pale orange; nervures pale; second cubital cell a little broader than high, receiving recurrent nervure a little beyond the middle; legs black, with white hair, the tarsi red only at tip; hair on inner side of hind basitarsi shining white; abdomen moderately shining, the tergites with pallid margins; tergites 1 to 5 with pure white hair-bands, on first only at sides, on second very slender and weak in middle, on the others broad and entire; apical plate (often concealed) fulvous, with a black line down the middle and black margins, while at its base is a broad fringe of pale reddish hair, though on each side of it is a pencil of pure white hair.

S.W. AFRICA : Gobabis, alt. 4647 ft., 8 ♀♀, 16.xii.1933 (*J. Ogilvie, L. Ogilvie*). The locality is printed "Gobasis" on the labels. It differs from *N. bellicornis* Friese by the white hair-band on fifth tergite; from *N. pygmaea* Friese by the more shining mesonotum. The following key separates a series of similar species (females):—

Scutellum with red hair; abdomen with broad bands of pale red tomentum

*laticinctula* Ckll.

Scutellum without red hair . . . . . 1.

1. Scutellum dull; flagellum red beneath . . . . . *opacibasis sublucens* Ckll.

Scutellum at least partly shining . . . . . 2.

2. Head large; stigma small . . . . . *gobabica* Ckll.

Head ordinary; stigma very large . . . . . *matophila* Ckll.

***Nomia bechuanella* sp. n.**

♀. Length 6.2 mm., anterior wing 4.0 mm.; black, moderately robust, the head broader than long; face, sides of front, and cheeks with pure white hair; mandibles faintly reddish apically; flagellum clear red beneath; clypeus dull, hairy; a shining band across top of head behind ocelli; hair of thorax white at sides, but fulvescent dorsally, the scutellum thinly but evidently hairy; a white axillary mark at each side of scutellum, and postscutellum with a white band, interrupted in middle; area of metathorax minutely punctate or reticulate, not plicate, the sculptured area not extending backward in middle; mesonotum and scutellum dull; tegulae small, pale rufotestaceous; wings short, dusky, stigma small and very pale yellowish, nervures pale, second cubital cell very small; legs black, the tarsi red apically; femora and tibiae carrying much pollen; abdomen moderately shining, the hind margins of tergites pallid; first tergite with a narrow pale apical band; second to fourth with increasingly wide bands of fulvous tomentum, the last band may or may not be somewhat paler than the others; fifth tergite with dark fuscous hair; apical plate with appressed bright copper-red hair.



BECHUANALAND : Palapye Road, 4.iii.1934, 3 ♀♀ (*J. Ogilvie*). Related to *N. microsoma* Ckll. and *N. pygmaea* Friese, but known by the dull mesonotum. In having the fifth tergite with dark hair it resembles *N. albidula* Friese. A female from Otavi, 27.xii.1933 (*J. Ogilvie*) is larger, without any red at end of abdomen; it is referred to *N. albidula* Friese, as it agrees sufficiently with the original description and with my notes on a specimen determined by Friese; but it is in poor condition, and the locality is more than a thousand miles from the type locality of *N. albidula*, so it is not unlikely that more and better material would show distinctive characters.

*Nomia rufitarsis pulchella* (Friese).

S.W. AFRICA : Otavi, 29.xii.1933 (*J. Ogilvie*).

*Nomia pygmaeola* sp. n.

♀. Length about 5.0 mm., anterior wing about 3.5 mm.; black, robust, with broad abdomen; head broad, face and sides of front with white hair; greater part of mandibles red; flagellum red beneath; clypeus dull, the apical part with a broad depression, on each side of which, at the margin, is a small brilliantly shining spot, but to see these spots it is necessary to view the face from somewhat below; vertex dull, but a shining space at each side of ocelli; mesonotum and scutellum with little hair, no band along hind margin of mesonotum, which is shining and distinctly punctured; scutellum shining, with a slight median depression; postscutellum with dense creamy-white hair; area of metathorax with a narrow band crossed by plicae, the area beyond punctate, the punctures running in lines; tegulae very small, fulvous; wings strongly dusky, stigma very pale reddish; nervures brown, second cubital cell very broad, receiving recurrent nervure beyond middle; legs black, with the small joints of tarsi red, tibiae also more or less reddened apically; hair of hind tibiae white; abdomen short and broad, the tergites with narrow pallid margins; hair-bands fulvescent, but pale, at sides only of first two tergites, entire on third and fourth, and apex also with light fulvous hair.

S.W. AFRICA : Gobabis, 17.xii.1933 (*J. Ogilvie*). A peculiar little species, to be compared with two others as follows :

Margins of tergites black, the last two black-haired

*inaequalis* Friese (*inermis* Friese).

Margins of tergites pallid . . . . . 1.

1. Mesonotum very finely punctured, somewhat shining . . . *pygmaea* Friese.

Mesonotum strongly punctured, shining . . . . . *pygmaeola* Ckll.

*Nomia laticincta* [Friese MS.] sp. n.

♀. Length about 9.0 mm., anterior wing 6.6 mm.; black, robust, mandibles red in middle, flagellum bright red beneath; hair of face, cheeks, pleura and metathorax greyish-white, of vertex slightly fulvous, of mesonotum pale greyish fulvous (no black hairs), of scutellum ferruginous; head broad, orbits strongly converging below; clypeus with only the upper part distinctly hairy, surface of clypeus shining, strongly punctured, with a broad depression in middle so that clypeus is distinctly bigibbous; a shining spot in front of anterior ocellus on each side; mesonotum and scutellum entirely dull; metathorax hairy all over, the basal area very small; tegulae rather large, fulvous, with a shining margin; wings dusky, with no distinct apical cloud; stigma small, very dark brown; second cubital cell broad, receiving recurrent nervure much beyond middle;

legs very dark brown, middle femora with a tooth beneath near base; hind tibiae and tarsi light red, except that the basitarsi have an apical cloud, and the next two joints are dark; abdomen dullish, the first tergite quite dull, hind margin of first tergite narrowly pallid, of second to fourth broadly so, with thin white hair-bands, on second and third the lower margin of black area is reddened; fifth tergite with very dark brown hair, white at extreme sides, apex with dark hair; venter reddish.

PORTUGUESE E. AFRICA : Rikatla, Delagoa Bay (*Junod*).

***Nomia laticincta mafekingensis* subsp. n.**

♀. Length about 9.0 mm., anterior wing 7.0 mm., similar to *N. laticincta* Ckll., so that it seems best to regard it as a local race, but it differs thus: clypeus less shining, not evidently bigibbous; flagellum dark, obscurely reddened beneath; hair of mesonotum pale yellowish-grey, strongly contrasting with the bright red of scutellum (thus resembling *N. murinella* Ckll.); nervures very dark, second cubital cell higher than broad; hind basitarsi with about the apical half dark; first tergite without a distinct pale border; second tergite with a broad red margin, and no distinct hair-band.

CAPE PROVINCE : Mafeking, 1.iii.1934 (*J. Ogilvie*).

For many years I have had *N. laticincta* in my collection, but no description has been published, so far as I can learn. It is very close to *N. murinella* Ckll., differing in the colour of legs and tegulae; possibly it should be regarded as a race of *N. murinella*. There is also much resemblance to the larger, more robust, *N. natalensis* Ckll., which does not have the very hairy metathorax, and has dark hind basitarsi. The hairy metathorax associates *N. laticincta* with *N. perornata* Ckll. and *N. somereni* Ckll., species which have the wings with a strong dark hind margin.

***Nomia sanguinolenta* Friese.**

♂. Length about 8.0 mm., anterior wing 6.0 mm.; antennae black, very faintly brownish beneath; face with greyish-white hair; clypeus dull and densely punctured; front shining; vertex brilliantly polished, impunctate; mesonotum shining, with three conspicuous impressed lines at anterior middle; scutellum shining; greyish hair before and behind scutellum; tegulae pellucid, almost colourless, not enlarged; wings hyaline, stigma very dark brown, nervures dark; in the Okahandja specimen the second cubital cell is excessively narrow; legs black, the tarsi pale reddish, more or less stained with blackish; hind femora very stout, but rounded above; hind tibiae greatly broadened apically, the inner apical corner with a red spine; first two tergites orange-fulvous, with a large black saddle, that on second much the longest; the remaining tergites black, with the hind margin pallid, the fourth and fifth with thin white hair-bands; apical plate very broad, light red; venter with patches of greyish-white tomentum.

S.W. AFRICA : Okahandja, 22.i.1934 (*L. Ogilvie*); Otavi, 27.xii.1933 (*L. Ogilvie*). I refer this to *N. sanguinolenta*, previously known only in the female, as it comes from the same region, and seems to differ only as the male might be expected to do.

***Nomia epileuca* sp. n.**

♀. Length about 9.5 mm., anterior wing 7.0 mm.; black, robust, the first four tergites with broad dull white tegumentary bands, that on first narrowest; head broad; face and front with dull white hair; clypeus dull, somewhat depressed in middle, from beneath its lower margin are long flavescent hairs; supraclypeal area dull, the lower edge narrowly

shining; mandibles obscurely reddish in middle; flagellum rather dusky red beneath; region of ocelli shining; mesonotum and scutellum bare, dull, feebly shining, with extremely minute punctures; along the anterior margin the mesonotum has a band of flavescent tomentum, widely interrupted in middle, and extending narrowly along sides; postscutellum with abundant long pale hair; area of metathorax triangular, dull, not evidently sculptured, but the microscope shows fine plicae at the sides; posterior truncation with little hair; tegulae rather large, pale translucent testaceous; wings strongly dusky, stigma small, dark brown, nervures brown; second cubital cell large, but higher than wide, receiving recurrent nervure a little beyond the middle; legs black, the tarsi reddened at apex, the tarsi have red hair on inner side; abdomen moderately shining, the hair at apex dense and pale fulvous; venter with bands of red hair.

S.W. AFRICA : Seeheim, 19.ii.1934 (*J. Ogilvie*). Related to *N. leucophara* Ckll., but smaller, with hair of thorax different. It differs from *N. emicata* Ckll. by the white band on first tergite, and the hair of thorax.

***Nomia matha* (Cameron) subsp. *breviceps* subsp. n.**

♂. Head remarkably broad and short, the face densely covered with long hair, which is shining white on clypeus, flavescent around antennae; antennae black, rather short for a male; anterior and middle knees, anterior tibiae, middle tibiae at base and apex, hind tibiae except a large black mark in middle, and all the tarsi, clear red; hind legs not modified, the tibiae have a strong dentiform angle on inner side at apex; abdomen with narrow pale, slightly flavescent, hair-bands; tergites gibbous before the apex, the third and fourth in lateral view thorn-like, with a projecting point; fourth sternite with a pair of tubercles close together in the middle. Wings dark fuliginous, stigma light red.

“S.W. AFRICA : Cape Town, Beaufort West, 28.xi.1933” (*J. Ogilvie*).

This is certainly a male of the *N. matha-rugicollis* series, only known hitherto from females. A female of the *N. matha* type came with the same data. *N. rugicollis* Friese appears not to be strictly identical with *N. matha*, and what I have as *N. matha* is not exactly like the type. Probably there are several races or closely allied species. The type locality of *N. matha* (which Cameron describes as having the stigma black) is Brak Kloof; I examined what purports to be the type, in the British Museum. Dr. H. Brauns found a specimen marked type in the Grahamstown Museum, and said it was a *Colletes*. Both Cameron and Friese put type labels on all the specimens before them when describing, and it is not rarely found that “types” belong to different species. When I visited Alfken in Bremen in 1927, he suggested that he and I should go to Berlin, and study the Friese collection, designating holotypes for all the species. This was and is very desirable, but was not found practicable. The type locality of *N. rugicollis* (now designated, from the three cited) is Lovedale, which is a mission station at Alice, 1720 ft. alt., rainfall about 28 inches.

***Nomia trichonota* sp. n.**

♂. Length about 11.0 mm., anterior wing 8.0 mm.; black, with the very long flagellum dusky red beneath, the legs dark, with tarsi red at apex, and the hind tibiae with a broad, pointed pale yellow apical lobe; mandibles faintly reddened apically; head broad, eyes converging below; face and lower part of front densely covered with clear white hair; cheeks with long white hair; mesonotum, scutellum and postscutellum with abundant pale flavescent (varying to distinctly fulvescent) hair, the hair in region of scutellum long and thick; mesonotum and scutellum dull, the surface almost hidden;

metathorax very hairy, the basal area a narrow inconspicuous channel; tegulae testaceous, rather large, but not of the greatly enlarged type; wings hyaline, not at all reddish, or clouded at apex; stigma small, dusky reddish; nervures brown, second cubital cell nearly square, receiving recurrent nervure beyond the middle; legs with much pale hair, anterior tarsi not fringed; hind femora greatly enlarged, trigonal, the hump beyond the middle, the lower side with a strong subapical dentiform angle; hind tibiae stout but not dentate, with a pale apical lamella; abdomen parallel-sided, the basal part pale red beneath; second and following tergites with pellucid margins; first tergite covered with long pale hair, the others with thin slightly fulvescent hair, not forming distinct bands; in the type the fourth tergite is extended, showing at its base an even fringe of pure white hair, which would ordinarily be concealed; fourth sternite deeply emarginate apically.

S.W. AFRICA: Seeheim, 19.ii.1934, 2 ♂♂ (*J. Ogilvie*). In my tables it runs near *N. umbilensis* (Ckll.), but the colour of the wings is quite different. There is some resemblance to *N. magniventris* Friese, from Abyssinia, but no very close affinity.

*Nomia amatha* Cockerell.

S.W. AFRICA: Otavi, 5.i.1934, one ♀, with face narrower than typical (*J. Ogilvie*). In my report (1935) on the bees of the Verney-Lang Kalahari Expedition I described three new species of *Nomia*. All three were obtained by the Ogilvies in S.W. Africa; *N. amatha* as above, *N. leucomelanura* (represented by a variant form *nosobina* Ckll.) at Gobabis, *N. ablusipes* at Okahandja.

*Nomia trilineata* Cockerell.

S. RHODESIA: Shangani, De Beers Ranch, 8-12.v.1932, one ♀, a little larger than typical (*J. Ogilvie*).

*Nomia crudelis* Westwood.

BELGIAN CONGO: Kabinda (*J. Bequaert*).

(B.) The following species have greatly enlarged tegulae:—

*Nomia interstitinervis auricauda* subsp. n.

♂. Similar to *N. lebrunae* Ckll., from the west shore of Lake Albert, but differing thus: mandibles red; postscutellum with white hair; apical part of metathoracic area not polished; boss of tegulae not black; stigma clear pale reddish; front tibiae and apical half of middle tibiae red, hind tibiae red with a black mark; hair on first tergite, and basal bands of tergites, white; broad band of tomentum on fifth tergite pure white; tergite six with tegument bright orange except at base. In the South African fauna this will be known by the face densely covered with cream-coloured hair; flagellum bright ferruginous beneath; mesonotum shining, with strong punctures, dense in middle; boss of tegulae pale fulvous, sometimes blackened on inner side; scutellum not spined; first recurrent nervure meeting intercubitus; third to fifth tergites with basal as well as apical hair-bands; hind tibiae short and broad, with an immense white apical lobe; middle tarsi thickened and intense black at apex, but not fringed.

CAPE PROVINCE: Upington, 2800 ft. alt. (type locality), 21.ii.1934, 3 ♂♂ (*J. Ogilvie*). S.W. AFRICA: Usakos, 16.i.1934, 4 ♂♂ (*J. Ogilvie*, *L. Ogilvie*).

From Upington come also three females of *N. interstitinervis* Strand, with pure white hair on face, and much larger, well-separated punctures in middle

of mesonotum. In spite of such differences, I am now persuaded that the male pertains to *N. interstitinervis* in a broad sense, that widely ranging species presenting different subspecies in different parts of its range, these being recognisable by the characters of the male. It is noteworthy that when M<sup>de</sup> Le Brun took *N. lebrunae* (male) at Kasenyi, she also took, on the day before, female *N. interstitinervis*. There is accordingly :

*N. interstitinervis* Strand (male, *N. guineaella* Strand). Guinea.

*N. interstitinervis lebrunae* (Cockerell). Dist. Kibali Ituri, Belgian Congo.

*N. interstitinervis auricauda* Cockerell. S.W. Africa and Cape Province.

Strand's male was in bad condition, and could not be adequately described.

*Nomia aurifera* Cockerell.

Kivu District : Uvira, 1931 (Cockerell); Lomami District, Kabinda (*J. Bequaert*). Fresh specimens have the postscutellum densely covered with fulvescent tomentum, as shown by the Kabinda example.

*Nomia atrinervis* Vachel.

BELGIAN CONGO : Kabinda (*J. Bequaert*); PORTUGUESE E. AFRICA : Beira (*L. Ogilvie*); S. RHODESIA : Victoria Falls (*J. Ogilvie*). The last is more robust than the others. From Kabinda come also two males of *N. stanleyi* (Ckll.), which is probably the male of *N. atrinervis*.

*Nomia rhodacantha* Cockerell.

S.W. AFRICA : Okahandja, 24.i.1934 (*J. Ogilvie*). One male, about 7.0 mm. long, front wing about 5.7 mm. This is smaller than the type, which came from near Lake Kivu, but in spite of the widely different locality, I cannot find characters indicating a different species.

*Nomia bevisiana* Cockerell.

NATAL : Weenen, ii.1925, 2 ♂♂ (*H. P. Thomasset*). The end of the abdomen has a pair of widely separated thorn-like teeth, and a truncate pale red lobe in the middle, but these structures may be wholly concealed. In fresh specimens the third and fourth tergites carry broad bands of pale tomentum. The mesonotum has a conspicuous covering of fulvescent hair.

*Nomia durbanensis mesostieta* subsp. n.

♀. Length about 6.5 mm., anterior wing 5.8 mm.; a small black species with enlarged tegulae, which are whitish with a very large black boss; sides of face with conspicuous white hair, but elypeus very thinly hairy; mandibles black with a faint red subapical spot; flagellum red beneath except basally; a cuneiform shining space at each side of ocelli; prothorax with dense dull white tomentum; mesonotum shining but not polished, with very widely scattered strong punctures; no hair-band between mesonotum and scutellum; scutellum dullish, with very large punctures; postscutellum covered with slightly fulvescent tomentum; basal channel of metathorax very narrow; sides of metathorax above not shining; wings hyaline, dusky at apex; stigma dull reddish, very obtuse at end; nervures brown; second cubital cell higher than broad, receiving recurrent nervure near end; basal nervure very strongly bent; legs black, the tarsi rufescent apically, hind basitarsi dusky reddish; first tergite all black, with a pair of very distinct

hair-spots, no line of punctures before depression; second to fourth each with two bands, the apical band on second slender, on third broader, on fourth very broad, all white; apex with dark brown hair. Quite distinct from *N. hadrosoma* Ckll. by the paler wings and tegulae, but much like *N. atrinervis* Vachel, from which it is easily distinguished by the glistening clypeus and supraclypeal area, with large punctures. *N. cinerea* Friese differs at once by the polished mesonotum and shining upper margin of truncation of metathorax. *N. aloephila* (Ckll.) is very similar, but smaller, with a much shorter clypeus. The closest affinity appears to be with *N. durbanensis* Ckll., from which it differs by the very strong conspicuous punctures on anterior part of mesonotum, in the region of the longitudinal lines, the larger scutellum and the darker antennae. It seems best to treat it as a subspecies of *N. durbanensis*.

S. RHODESIA : Matopo Hills, 17-30.iv.1932 (*Alice Mackie*).

### *Nomia macrozona* sp. n.

♀. Length about 8.0 mm., anterior wing 6.4 mm.; very robust, black, with the hind tibiae and tarsi bright ferruginous; mandibles black, obscurely reddish apically, with a strong longitudinal channel; head very broad; sides of face and front with coarse dull white hair; clypeus and supraclypeal area shining, well punctured, the punctures in middle of clypeus not dense, running more or less in transverse lines; vertex dull, with a little shining space at each side of ocelli; flagellum dusky red beneath; prothorax and tubercles densely covered with greyish-white tomentum; thorax above with very thin dull white hair; no band between mesonotum and scutellum; postscutellum with dense pale fulvescent hair, but its hind margin exposed; mesonotum and scutellum entirely dull, the microscope shows a minutely granular surface, and small well-separated punctures; basal channel of metathorax very slender; sides of metathorax not at all polished, but with a silky lustre; tegulae enlarged, brownish-white, with a large black boss; wings hyaline, a little dusky at apex; stigma reddish-brown, nervures pale brown, second cubital cell about square, first recurrent nervure meeting intercubitus; legs mainly dark brown, rufescent apically, hind tibiae and tarsi red; hind tibiae externally with silky white hair; hair on inner side of tarsi golden; abdomen broad, shining, first tergite anteriorly with long pale hair, but no hair-spots, or transverse hair-band, but hind margin with a pale hair-band, interrupted in middle; anterior to the depression on first tergite are irregularly placed strong punctures; tergites 2 to 4 with no basal bands, but with very broad apical bands of greyish-white tomentum, sparsely overlaid by long glittering hairs; apex with reddish-brown hair, white at extreme sides.

S. RHODESIA : Matopo Hills, x.1931, 3 ♀♀ (*J. Ogilvie*). Recognised by the entirely dull mesonotum, and the very broad abdominal bands, the basal bands of tergites lacking. In Strand's table it runs to *N. schubotzi* Strand, but it is really quite different. In my table it runs near *N. anthidioides* Gerst., but the abdomen is not at all as in that species. Friese's *N. arnoldi*, from the same region, is based on the male, but is evidently different. I saw *N. arnoldi* in the Bulawayo Museum, and noted : larger than *N. albitarsis* Friese, abdomen broad, with five white bands; flagellum red beneath, black at end; basitarsi pale yellow. Thus very near *N. meadewaldoi*, but much more robust.

*N. umtalica* Ckll. is related to *N. macrozona*.

### *Nomia usakoa* sp. n.

♀. Length 7.2 mm., anterior wing 5.0 mm., robust, black, legs dark, with the hind basitarsi reddened basally, and the apical joint of hind tarsi red; mandibles with the

apical half red; head very broad, with pure white hair at sides of face and front; clypeus dull, very finely and densely punctured, the upper part with a median depression, the lower part with a transverse area, the lower edge of which is shining, and on each side a somewhat elevated area, with coarser punctures; flagellum obscurely reddish beneath; prothorax with pure white hair, but the tubercles partly exposed, pale red; thorax dorsally bare, except that the postscutellum is covered with white tomentum; some very minute hairs between mesonotum and scutellum; mesonotum and scutellum dull, with sparse punctures, channel at base of metathorax linear, without plicae; metathorax dull, a little shining at sides; tegulae greatly enlarged, dull white with a light brown boss, marked with black on inner side; wings hyaline, not dusky apically; stigma pale ferruginous; nervures brown, second cubital cell square, first recurrent nervure joining third cubital cell, a short distance from base; abdomen broad, dullish; margins of tergites brown; first tergite with erect hair at extreme base, but no band or hair-spots, there are no evident punctures except a row just before the broad apical depression; second tergite with a shining channel at base, and a row of punctures before the apical depression, which shows some widely spaced appressed glistening hairs; third tergite greyish from a very thin covering of very short hairs, and with a narrow white hair-band at base; fourth with white hair on the raised portion, the depressed part with the tegument pale fulvous; apex with pale, faintly fulvescent hair.

S.W. AFRICA: Usakos, 16.i.1934 (*J. Ogilvie*). A distinct species, differing from *N. tangensis* Ckll. by the larger scutellum and quite different abdomen; from *N. umtalica* Ckll. by being smaller, with quite different abdomen. In Strand's table it runs to *N. schubotzi* Strand, but it is not that at all.

#### *Nomia cinerea* Friese, variety.

♀. Hair-bands on first three tergites flavescent, the very broad band on fourth pure white, contrasting; upper half of clypeus densely covered with white hair. The hair at apex of abdomen is very pale reddish; the lower part of area of metathorax is polished; scutellum with strong punctures on a shining ground (which excludes *N. granularis* Ckll.); in the Gobabis specimen the hind tibiae and all the tarsi are red, the basitarsi stained with blackish; in the Belmont one the legs are darker, the front and middle basitarsi blackish, but the middle ones red at base.

CAPE PROVINCE: Belmont, 23.ii.1934 (*J. Ogilvie*). S.W. AFRICA: Gobabis, 17.xii.1933 (*L. Ogilvie*). This is a weak race or variety of *N. cinerea*, which seems not to deserve a special name. A specimen from Mafeking, 1.iii.1934 (*J. Ogilvie*) also has dense white hair on clypeus, but it is remarkable for the dark flagellum, very feebly rufescent beneath. The abdomen has been wetted, and the colour of its pubescence cannot be described.

## NOTES ON THE GENERIC NOMENCLATURE OF THE LEPIDOPTERA RHOPALOCERA, I.

By Francis HEMMING, C.M.G., C.B.E., F.R.E.S.

THE following notes have been made in the course of recent work on the generic nomenclature of the Lepidoptera Rhopalocera.

(a) Genera of which the types are here designated for the first time.

### SATYRIDAE.

#### *Mygona* Westwood.

Westwood, 1851, *in* Doubleday, Gen. diurn. Lep. (2) : 357.

Type : *Pronophila thelebe* Doubleday, 1849.

Westwood gave what he called "*Mygona* Boisduval MS." as a synonym of *Pronophila* Doubleday, 1849. The type of *Mygona* Westwood (for the name *Mygona* must be credited to Westwood by whom it was published) is necessarily *thelebe* Doubleday, the type of *Pronophila* Doubleday, of which therefore *Mygona* Westwood is a synonym.

### AMATHUSIIDAE.

#### *Moera* Hübner.

Hübner, [1819], Verz. bek. Schmett. (4) : 51.

Type : *Moera philippe* Hübner, [1819].

The name *Moera* Hübner is invalid, since *philippe* Hübner is a synonym of *Papilio phidippus* Linnaeus, 1763, the type of *Amathusia* Fabricius, 1807.

#### *Thoraessa* Westwood.

Westwood, 1850, *in* Doubleday, Gen. diurn. Lep. (2) : 326.

Type : *Papilio phidippus* Linnaeus, 1763.

Westwood gave what he called "*Thoraessa* Boisduval MS." as a synonym of *Amathusia* Fabricius, 1807. Boisduval had never published the name which must, therefore, be attributed to Westwood himself. The type of *Thoraessa* Westwood is necessarily *phidippus* Linnaeus, the type of *Amathusia* Fabricius, of which therefore *Thoraessa* Westwood is a synonym.

### NYMPHALIDAE.

#### *Azania* Martin.

Martin, 1903, Deuts. ent. Z. Iris 16 : 160.

Type : *Papilio camillus* Fabricius, 1781.

Though available nomenclatorially, the name *Azania* Martin is not required, since *Papilio camillus* Fabricius is congeneric with *Papilio thyonaeus* Cramer, 1779, the type of *Cyrestis* Boisduval, 1832.



*Catargyria* Hübner.

Hübner, [1823], Samml. exot. Schmett. 2 : pl. [64].

Type : *Catargyria laura* Hübner, [1823], ♂.

Scudder's selection (1875, Proc. amer. Acad. Arts Sci., Boston, 10 : 136) of *Catargyria seraphina* Hübner as the type is invalid, since, as I have shown (Hemming, 1937, Hübner 1 : 407), pl. [62] on which that species was figured was not published by Hübner till 1825. The figures given on pl. [64] (published in 1823) are all referred by Hübner to his *Catargyria laura*. That is, however, a composite species, the so-called male (figs. 1 and 2) representing *Papilio laure* Drury, 1773, while the so-called female is referable to *Catargyria druryi* Hübner, [1825]. One or other of these species must be the type of *Catargyria* Hübner, and I here select the former. Though available nomenclatorially, the name *Catargyria* Hübner is not required, since *Papilio laure* Drury is congeneric with *Papilio agathina* Cramer, 1777, the type of *Doxocopa* Hübner [1819].

*Chlorippe* Boisduval.

Boisduval, 1870, Consid. Lépid. Guatemala : 47.

Type : *Nymphalis laurentia* Godart, 1824.

The name *Chlorippe* Boisduval is invalid, since it is both a homonym and a synonym of *Chlorippe* Doubleday, 1844, itself a name which falls to *Doxocopa* Hübner, [1819].

*Eucalia* Felder, C.

Felder, C., 1861, N. Act. Akad. Caes. Leopold. 28 (3) : 25.

Type : *Diadema anthedon* Doubleday, 1845.

The name *Eucalia* Felder is invalid, the type being the same species as that of *Euralia* Westwood, 1850, itself a name which falls to *Hypolimnas* Hübner, [1819].

*Eunice* Geyer.

Geyer, 1832, in Hübner, Zutr. z. Samml. exot. Schmett. 4 : 39, 44.

Type : *Eunice taurione* Geyer, 1832.

The name *Eunice* Geyer is invalid, because it is a homonym of *Eunice* Rafinesque, 1815 (Analyse : 135) and of *Eunice* Schinz, 1822 (in Cuvier, Thierreich 2 : 810). It does not require to be replaced, since *Eunice taurione* Geyer is congeneric with *Papilio amelia* Cramer, 1777, the type of *Evonyma* Hübner, [1819].

*Heurema* Herrich-Schäffer.

Herrich-Schäffer, 1865, CorrespBl. zool.-min. Ver. Regensburg 19 : 89 (Separate as Prodrömus 1 : 71).

Type : *Papilio lethe* Fabricius, 1793.

The name *Heurema* Herrich-Schäffer is invalid, (a) because it is a homonym of *Heurema* Agassiz, 1846 (Nomencl. zool. Index univ. (4to ed.) : 181) and (b) because its type is the same species as that of *Hypanartia* Hübner, [1821].

*Megistanis* Doubleday.

Doubleday, 1844, List Spec. lep. Ins. B.M. 1 : 109.

Type : *Papilio cadmus* Cramer, 1775.

Scudder (1875, Proc. amer. Acad. Arts Sci., Boston, 10 : 213) failed to observe that *Megistanis beotus* Boisduval, which he selected as the type of this

genus, was nothing but a MS. name when published by Doubleday and therefore was ineligible for selection as the type. The type is automatically *Papilio cadmus* Cramer, the only other species given by Doubleday.

*Timetes* Boisduval.

Boisduval, 1870, *Consid. Lépid. Guatemala* : 44.

Type : *Papilio marius* Cramer, 1779.

The name *Timetes* Boisduval is invalid, (a) because it is a homonym of *Timetes* Doubleday, 1844 (*List Spec. lep. Ins. B.M.* 1 : 87), and (b) because its type is the same species as that of *Euglyphus* Billberg, 1820 (*Enum. Ins.* : 80), itself a name which falls to *Marpesia* Hübner, 1818.

RIODINIDAE.

*Desmozona* Boisduval.

Boisduval, 1836, (*Roret's Suite à Buffon*) *Lépid.* 1 : explic. pl. 6 [= pl. 2B], pl. 21 [= pl. 5C].

Type : *Desmozona acheröis* Boisduval, 1836.

Though available nomenclatorially, the name *Desmozona* Boisduval is not required, since *acheröis* Boisduval is congeneric with *caricae* Linnaeus, the type of *Nymphidium* Fabricius, 1807.

*Hexuropteris* Hübner.

Hübner, [1819], *Verz. bek. Schmett.* (2) : 22.

Type : *Hexuropteris endymiaena* Hübner, [1819].

The name *Hexuropteris* Hübner is invalid, the type being a synonym of *Papilio gnidus* Fabricius, 1787, the type of *Rusticus* Hübner, [1807], itself a name which falls to *Helicopsis* Fabricius, 1807.

PIERIDAE.

*Acraea* Hübner.

Hübner, [1819], *Verz. bek. Schmett.* (6) : 93.

Type : *Papilio nerissa* Fabricius, 1775.

The name *Acraea* Hübner is invalid, because it is a homonym of *Acraea* Fabricius, 1807. It does not require to be replaced, since its type is a synonym of *Papilio coronis* Cramer, 1775, the type of *Cepora* Billberg, 1820.

*Calicharis* Oberthür.

Oberthür, 1876, *Études Ent.* 1 : 18.

Type : *Anthocharis delphine* Boisduval, 1836.

Though available nomenclatorially, the name *Calicharis* Oberthür is not required, since *Anthocharis delphine* Boisduval, which is a synonym of *Anthocharis antigone* Boisduval, 1836, is congeneric with *Papilio calais* Cramer, 1775, the type of *Colotis* Hübner, [1819].

*Colias* Hübner.

Hübner, [1819], Verz. bek. Schmett. (7) : 99.

Type : *Papilio sennae* Linnaeus, 1758.

The name *Colias* Hübner is invalid, because it is a homonym of *Colias* Fabricius, 1807. It does not require to be replaced, since *Papilio sennae* Linnaeus is the type also of *Callidryas* Boisduval & Leconte, [1830], itself a name which falls to *Phoebis* Hübner, [1819].

## PAPILIONIDAE.

*Endopogon* Lacordaire.

Lacordaire, 1833, Ann. Soc. ent. France 2 : 384.

Type : *Papilio sesostris* Cramer, 1779.

Though available nomenclatorially, the name *Endopogon* Lacordaire is not required, since *Papilio sesostris* Cramer is congeneric with *Princeps echelus* Hübner, [1815], the type of *Parides* Hübner, [1819].

*Laertiades* Doubleday.

Doubleday, 1846, Gen. diurn. Lep (1) : 5.

Type : *Papilio philenor* Linnaeus, 1771.

The name *Laertiades* Doubleday is invalid, the type being the same species as that of *Laertias* Hübner, [1819], itself a name which falls to *Battus* Scopoli, 1777.

*Parnassis* Hübner.

Hübner, [1819], Verz. bek. Schmett. (6) : 90.

Type : *Papilio apollo* Linnaeus, 1758.

The name *Parnassis* Hübner is invalid, the type being the same species as that of *Parnassius* Latreille, 1804.

(b) Five genera at present without valid names.

## NYMPHALIDAE.

*Baeotus* gen. n.

*Generic characters.*—I select as the generic characters of *Baeotus* Hemming the characters given by Seitz for *Megistanis* Westwood when he dealt with this genus in 1914 (Grossschmett. Erde 5 (Exot. 194) : 472).

Type : *Baeotus baeotus* (Doubleday, 1849) (= *Megistanis baeotus* Doubleday, 1849, Gen. diurn. Lep. (2) pl. 48 fig. 2).

The name given above is proposed because *Megistanis* Doubleday, 1844, is not available for *Megistanis baeotus* Doubleday, the type of *Megistanis* Doubleday being *Papilio cadmus* Cramer, 1775.

*Zingha* gen. n.

*Generic characters.*—I select as the generic characters of *Zingha* Hemming the characters given by Mabille for *Monura* Mabille, 1877 (Bull. Soc. zool. France 1 : 280).

Type : *Zingha zingha* (Stoll, 1780) (= *Papilio zingha* Stoll, 1780, in Cramer, Utitl. Kapellen 4 (27) : 53, pl. 315 fig. B, C.).

The name *Zingha* Hemming is required, since *Monura* Mabille, 1877 (of which *Papilio zingha* Stoll is the type) is a homonym of *Monura* Ehrenberg, 1831 (Sym. Phys. Phyt. : sign. e) and of *Monura* Gistel, 1848 (Nat. Thierr. : 155).

## RIODINIDAE.

*Calvus* gen. n.

*Generic characters*.—I select as the generic characters of *Calvus* Hemming the characters given by Seitz for the genus *Drepanula* Röber, 1892, when he dealt with that genus in 1917 (Grossschmett. Erde 5 (Exot. 259) : 698).

Type : *Calvus calvus* (Staudinger 1887) (= *Lemonias calvus* Staudinger, 1887, in Staudinger and Schatz, Exot. Schmett. 1 (Th. 1) : 259 pl. 92).

The name given above is proposed, because *Drepanula* Röber, 1892, is invalid, being a homonym of *Drepanula* Frölich, 1828 (Enum. Tort. Württ. : 11).

*Menander* gen. n.

*Generic characters*.—I select as the generic characters of *Menander* Hemming the characters given by Seitz for *Tharops* Hübner, [1819], when he dealt with the genus in 1917 (Grossschmett. Erde 5 (Exot. 263) : 716).

Type : *Menander menander* (Stoll, 1780) (= *Papilio menander* Stoll, 1780, in Cramer, Utitl. Kapellen, 4 (28) : 86 pl. 334 fig. C, D).

The name given above is proposed, because *Tharops* Hübner, [1819], is invalid, being a homonym of *Tharops* Rafinesque, 1815 (Analyse : 119).

## HESPERIIDAE.

*Aecas* gen. n.

*Generic characters*.—I select as the generic characters of *Aecas* Hemming the characters given by Godman for *Flacilla* Godman, 1901 (in Godman & Salvin, Biol. cent.-amer. Lep.-Rhop. 2 : 593).

Type : *Aecas aecas* (Stoll, 1781) (= *Papilio aecas* Stoll, 1781, in Cramer, Utitl. Kapellen 4 (29) : 102 pl. 343 fig. A, B).

The name given above is proposed, because *Flacilla* Godman, 1901, is invalid, being a homonym of *Flacilla* Koken, 1896 (Jahrb. geol. ReichsAnst. 46 : 92).

(c) Notes on the status of two genera.

## NYMPHALIDAE.

*Murwareda* Moore.

In 1934 (Gen. Names hol. Butt. 1 : 95) I pointed out that *Papilio athamas* Drury, 1773, and its allies could not (as hitherto) be referred either to *Eulepis* Scudder (mistakenly regarded by that author as identical with *Eulepis* Billberg, 1820) or to *Eriboea* Hübner, [1819], and I went on to say that the oldest available generic name for these species was *Murwareda* Moore, 1896 (Lep. ind. 2 (24) : 263) (type, *Charaxes dolon* Westwood, 1847). In making this latter statement, I was in error, since I overlooked the fact that *Papilio pyrrhus* Linnaeus, 1758, the type of *Polyura* Billberg, 1820 (Enum. Ins. : 79) is congeneric with *Papilio athamas* Drury. The position is therefore that, though available nomenclatorially, the name *Murwareda* Moore, 1896, is not required, its type being congeneric with that of *Polyura* Billberg, 1820.

## PAPILIONIDAE.

*Agehana* Matsumura.

Type : *Agehana elwesi maraho* (Shiraki & Sonan, 1934).

*Papilio maraho* Shiraki & Sonan, 1934, *Zephyrus* 5 : 177.

*Agehana maraho* (Shiraki & Sonan) Matsumura, 1936, *Ins. matsumur.* 10 : 86 pl. 2.

The good coloured plate given by Matsumura shows that *maraho* Shiraki & Sonan, which was discovered in Formosa, is the Formosan subspecies of the insect originally discovered in Kiukiang and named *Papilio elwesi* Leech (1889, *Trans. ent. Soc. Lond.* 1889 : 113, pl. 7 fig. 1).

This species differs from all other known swallowtails in that the dilation of the tails of the hind-wings is so great that each tail is supported by two veins instead of by one only. It is on this character that *Agehana* Matsumura (1936, *Ins. matsumur.* 10 : 86) can properly be separated from the remainder of Haase's "Rinnenfalter," which are referable to *Papilio* Linnaeus, 1758 (type, *Papilio machaon* Linnaeus, 1758).

## BOOK NOTICE.

A catalogue of the original descriptions of the *Rhopalocera* found north of the Mexican border. Part 2. The SATYRIDAE. By C. F. DOS PASSOS. pp. S1-S13. (*Bull. Cheyenne Mount. Mus.* 1 (2)). 1939. Price 50 cents.

This second part of the catalogue of original descriptions of butterflies from North America follows closely the pattern of the first part. The following minor changes have, however, been made : Genotypes are now centred under the generic name, Subspecies are lettered in order, and Synonyms are printed in different type.

SOME TYPE SPECIMENS OF *DELIAS* (LEP. PIERIDAE) DESCRIBED BY FRUHSTORFER

By G. TALBOT, F.R.E.S.

THE recent acquisition by the British Museum (Natural History) of the remainder of the Fruhstorfer collection has enabled me to clear up certain difficulties in connection with Fruhstorfer's description of various races of *Delias* which remained obscure at the time of the publication of my monograph of this genus. Two new subspecies are also described, and notes added on certain interesting specimens from the Adams collection. The arrangement is according to that adopted in the monograph.

All the specimens referred to below are in the British Museum (Natural History).

1. *Delias hempeli* Dann., ♀.

♂. *Delias hempeli* Dannatt, 1904, *Entomologist* 37 : 173, pl. VII, fig. 3 (Gilolo).

A female of this species was found in the Fruhstorfer collection mixed with *candida* and labelled "♀ f. *hempeli*."

♀. Upperside black with submarginal creamy spots, closely resembling *D. candida herodias* Voll. which inhabits the same island. Fore-wing strongly dusted with white over the basal area, extending in the cell to beyond vein 2 and filling the base of area 2; costal edge creamy-white, except proximally and near the apex; six submarginal creamy-white spots as in *herodias* but larger; the anterior spot in area 6 is elongate, with a linear prolongation to the margin, and is placed well distad of the spot above it; in *herodias* the two spots have their proximal ends almost in line; the posterior four spots are of somewhat triangular shape with their apices reaching the margin; there is a small indistinct almost double spot below vein 2, close to the margin. Hind-wing with a submarginal row of six creamy-white spots very much as in *herodias*, but with the exception of the anterior oval spot, they are more distinctly triangular with their apices touching the margin; basal area, to end of cell, dusted with white as on fore-wing.

Underside resembles the ♂, and differs from any form of *candida* especially by the absence of any orange-coloured spots on the hind-wing. Fore-wing with greyish-white basal area, extending to the tornus below vein 2, and more strongly marked than in the ♂; some yellow suffusion in the basal half of the cell; costa edged with creamy-white; submarginal spots as on upperside, the two anterior ones tinged with yellow. Hind-wing as in the ♂, the anterior submarginal spot deep yellow, the other spots creamy-white and tinged with yellow, larger than on the upperside, the inner edge of the four posterior ones strongly incurved.

Length of fore-wing : 35 mm., expanse : 72 mm.

*Habitat*.—Halmaheira, one specimen, from the Fruhstorfer collection. Only a single pair of this species is now known.

2. *Delias sanaca perspicua* Fruhst.

*Delias belladonna perspicua* Fruhstorfer, 1910, in Seitz, *Macrolep. Erde* 9 : 130, t. 56a (♀).

*Delias sanaca perspicua* Jordan, 1925, *Nov. Zool.* 32 : 282.

Both sexes were described by Fruhstorfer (1910), and the types are in the Fruhstorfer collection. The ♂ belongs to *belladonna* Fabr., and the ♀ to *sanaca* Moore. Jordan (1925), noting the description as insufficient to determine the species, selected as the type the ♀ figured in Seitz.

3. *Delias belladonna yedanula* Fruhst.

*Delias belladonna yedanula* Fruhstorfer, 1910, in Seitz, *Macrolep. Erde* 9 : 130 (Omei Shan).

The types are in the Fruhstorfer collection. The ♂ is *patrua* Leech, and the ♀ is *berinda adelma* Mitis.

4. *Delias crithoe villia* Fruhst.

*Delias crithoe villia* Fruhstorfer, 1910, in Seitz, *Macrolep. Erde* 9 : 134, t. 56a (West Sumatra).

The types of this insect are in the Fruhstorfer collection. The ♂ cannot be distinguished from typical *tobahana* Rog. from Sinabong. The ♀ is purer white on the hind-wing, but yellowish to white examples occur together in the Korintji district. The race *tobahana* is slightly variable, and two forms cannot be distinguished.

5. *Delias discus discus* Honr.

*Delias discus* Honrath, 1886, *Berlin. ent. Z.* 30 : 130, pl. V, fig. 4 (♀) (Sekar).

*Delias discus discus* Talbot, 1937, *Monogr. Delias* : 347 (partim).

The nominotypical form came from Sekar on the Onin Peninsula. It is represented in the British Museum by a female from the Adams collection, collected by A. E. Pratt in the district of Fak Fak, 1700 feet, January to February, 1908.

Most specimens of the species in collections are from the Weyland Mountains and central Dutch New Guinea. These belong to the race *captorima* Van Eecke, 1915 (*Nov. Guinea* 13 : 58, pl. II, fig. 4).

The ♀ of the nominotypical form is distinguished from *captorima* by the deeper yellow colour of the hind-wing area, and in this area being similarly coloured throughout, and extending more distad, with a more sharply defined edge.

6. *Delias descombesi* f. *leucacantha* Fruhst.

*Delias descombesi leucacantha* Fruhstorfer, 1910, in Seitz, *Macrolep. Erde* 9 : 131, t. 52b (Sikkim).

The type of this form is a ♀ from Sikkim, with extended yellowish-white colouring on hind-wing, and on the fore-wing with veins 2, 3 and 4 more strongly striped with white; very like a small ♀ from Assam in the British Museum.

7. *Delias belisama* f. *angaja* Fruhst.

*Delias belisama* f. *angaja* Fruhstorfer, 1910, in Seitz, *Macrolep. Erde* 9 : 132 (W. Java).

The brief description of this form in Seitz is misleading. According to the type, a ♀ from Mt. Gede, the upperside is very pale orange, and the fore-wing underside is without the yellow suffusion over the cell which is characteristic of *aurantia*. The hind-wing underside is less orange than in *aurantia*, but deeper yellow than in most *belisama* females, all gradations existing between it and creamy-yellow ones. The name may be applied to the more deeply yellow females from West Java, but these never resemble *aurantia* on the upperside.

8. *Delias belisama nakula* ♂ f. *auratilis* Fruhst.

*Delias belisama nakula* f. *auratilis* Fruhstorfer, 1910, in Seitz, *Macrolep. Erde* 9 : 132, t. 52d.

This form has the upperside of hind-wing yellow or tinged with yellow. The type specimen is only slightly tinged with yellow on the fore-wing, and the five other males in the British Museum are without any yellow tinge on the fore-wing.

9. *Delias aruna arovana* Fruhst.

*Delias aruna arovana* Fruhstorfer, 1913, *Ent. Runds.* 30 : 124 (Rossel Island).

This race was known from Rossel and Sudest Is. In the Adams collection were 4 ♂♂ 3 ♀♀ from St. Aignan, an island near Rossel.

10. *Delias sacha sacha* Gr.-Sm.

*Delias sacha* Grose-Smith, 1895, *Nov. Zool.* 2 : 75 (♂, Obi).

The Fruhstorfer collection contained one ♂ of this rare species of which only about 3 ♂♂ are known, the ♀ being still unknown from Obi. The ♂ presents a remarkable resemblance to *D. poecilea edela* Fruhst. which inhabits the same island.

11. *Delias hyparete luzonensis* f. *maenia* Fruhst.

*Delias hyparete peirene* Fruhstorfer, 1910, in Seitz, *Macrolep. Erde* 9 : 125 (Formosa).

The type specimen is a ♂ individual aberration in which the red and yellow scales on the hind-wing are deformed, being curled or twisted, especially the yellow ones over the basal area, giving this area a pink tinge, the submarginal band being dull orange. The name may be used to denote any specimens with orange instead of red spots on the hind-wing underside.

12. *Delias timorensis babberica* subsp. n.

♂. A light form resembling *moaensis* Roths. Upperside of fore-wing with the subapical spots shorter and narrower; grey-white area of variable extent as in the allied form. Hind-wing with the black border more even, more as in the nominotypical form, and not obviously dentate as in *moaensis*. Underside of hind-wing with yellow area as in *moaensis*, the red or orange discal dot absent or indistinct, the red submarginal spots larger than in allied forms.

♀. Upperside with basal areas purer white and not dusted with black as in the nominotypical form and in *moaensis*, and slightly more extended than in the nominotypical form. Underside of fore-wing very like *moaensis*; hind-wing as in the ♂.

*Habitat*.—BABBER ISLAND: 6 ♂♂, 4 ♀♀ (types); Kisser Island, 1 ♀; "Timor," 1 ♀; without locality: 2 ♂♂. Most of this material is from the Fruhstorfer collection.

13. *Delias mysis adelphoë* subsp. n.

The name for this race was found in the Fruhstorfer collection, but it appears never to have been published.

♂. Belongs to the group of *lara* forms. Upperside not different from specimens of *onca* Fruhst. from British New Guinea.

Underside of fore-wing with the yellow subapical band formed of four spots instead of three, the additional spot placed in area 7; this spot usually only indicated in mainland specimens; the anterior spot is smaller than in *onca*, and the spot in 6 is narrower. Hind-wing with narrower red band which has very narrow proximal black edging; the red band is placed more proximad, leaving a wide marginal black border which is wider than in the mainland forms; the black area narrows sharply from vein 5 to vein 6.

*Habitat*.—BRITISH NEW GUINEA: Yule Island, 1 ♂ (ex Coll. Fruhstorfer).

14. *Delias mysis rosselliana* Roths.

*Delias mysis rosselliana* Rothschild, 1915, *Ann. Mag. nat. Hist.* (8) 15 : 174 (♂♀, Rossell I.).

The Adams collection contained 4 ♂♂ of this species from St. Aignan, whence it has not previously been recorded.

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## BOOK NOTICE.

Catalogue raisonné des Coléoptères de France. Par J. Sainte-Claire DEVILLE complété et publié par A. MÉQUIGNON. (*L'Abeille* 36 : 1-466.) Paris (Société Entomologique de France). 1935-1938, 4 parts. Price 100 francs.

The four parts making this catalogue were published in April and November 1935, September 1937, and December 1938. They form the complete volume 36 of *L'Abeille*.

The work is, in the main, that of the late Sainte-Claire Deville, who unfortunately died before completion of the manuscript and its subsequent publication. By fortunate good chance his old friend Mons. Méquignon was approached and found willing to prepare and complete the manuscript and pilot it through the press. All workers on the Coleoptera of France will appreciate the spirit of the editor.

The treatment of the material is systematic throughout. Under each genus is arranged the species found in France, and for each species reference to "une bonne description, pas trop ancienne et de préférence rédigée en français" is given wherever possible. Synonymy is normally not noticed. For reasons of cost there is no bibliography.

At his death the author had completed more or less up to the end of the CHRYSOMELIDAE, the Rhynchophora and the Scarabaeoidea having not been written up. Few families were so finished as to be ready for the press and the debt owing to Mons. Méquignon by French Coleopterists is large.

## BOOK NOTICE.

The Fulgorina of Barro Colorado and other parts of Panama. By Z. P. METCALF. (*Bull. Mus. comp. Zool. Harvard* 82 : 277-423, 23 pls.). 1938.

This is a systematic work on the Fulgorina of the area mentioned in the title. The general classification used is based on that of Muir, supplemented by special work on restricted groups by other authors.

Serious attempt is made to settle the genotypes of many of the genera based on the author's card catalogue of titles of the relevant literature which extends to 750,000 items. The author adds that after 25 years of collecting and collating the literature of the Homoptera he is of the opinion that it is not possible to "collect and catalogue completely the literature dealing with even a small group of insects."

Many keys are given to subfamilies, tribes, genera, and species, and extensive use is made of illustration. Great reliance is placed on the use of genitalia in providing taxonomic characters. There are 139 titles in the bibliography.

## THE MORPHOLOGY OF THE THORAX OF THE PELORIDIIDAE (HOMOPT.)

By J. W. EVANS, D.Sc., M.A., F.R.E.S.

The PELORIDIIDAE which, according to Helmsing and China (1937), "comprise the rarest and most remarkable of the Hemiptera and which may well be descended in an almost direct line from proto-hemipterous ancestors," are the sole family of the Homopterous series Coleorrhyncha.

Up to the present six species have been described. These are *Pelordium hammoniorum* Breddin from South America, *Xenophyes cascus* Bergroth from New Zealand, *Hemiodoecus leai* China and *H. fidelis* Evans from Tasmania, *H. veitchi* Hacker from Queensland and *H. wilsoni* Evans from Victoria.

Until recently the available material of these insects was so limited that morphological studies were well-nigh impossible, but now although *P. hammoniorum* is still only represented by three specimens and *X. cascus* and *H. wilsoni* each by a single specimen, abundant material of the remainder is obtainable.

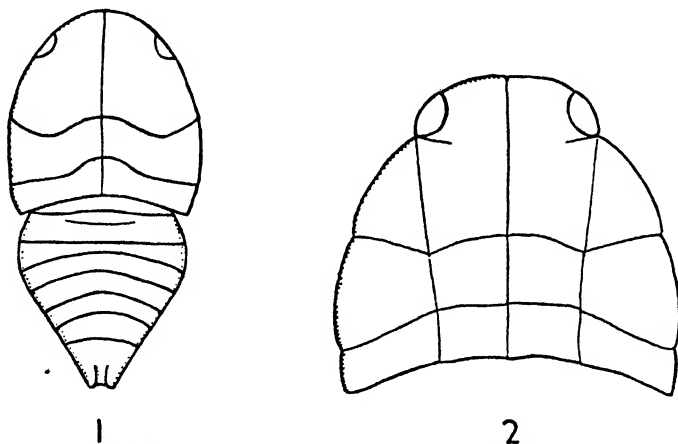


FIG. 1.—*Hemiodoecus fidelis*, first instar nymph, dorsal surface.

FIG. 2.—*Hemiodoecus fidelis*, second instar nymph, thorax, dorsal surface.

In an earlier paper (Evans, 1938) the morphology of the head of *Hemiodoecus fidelis* was described, and it was shown how the primitive structure of the head supplied a key to the understanding of the morphology of the head of insects in families comprised in the Auchenorrhyncha. The present paper is concerned with the morphology of the thorax, more particularly the prothorax.

### *Nymphal Instars.*

Helmsing and China found only four nymphal instars in *Hemiodoecus veitchi*, but were uncertain whether this was because they lacked material of a possible fifth instar. It is certain that there are only four if the pronymphal instar is excluded.

*First Instar.*

The first instar nymph of *H. fidelis* is shown in dorsal aspect in fig. 1. It will be noted that the head and pronotum are fused together and that the mesonotum is only slightly larger than the metanotum. Helmsing and China show a pair of pits on each thoracic segment, lying immediately behind the eyes, in their figure of the first instar nymph of *H. veitchi*. Similar pits have not been found in *H. fidelis*, but the invaginations of the pleural sutures are visible through the dorsal integument in identical positions.

*Second Instar.*

Fig. 2 represents the dorsal surface of the head and thorax of the second instar nymph of *H. fidelis*. Although the head is still partially fused with the pronotum, it does not form part of one curved surface with it. The principal point of interest is that a pair of sutures has been developed that extends posteriorly from the hind margin of the external border of the eyes on each side as far as the hind margin of the metanotum. These sutures cut off the wing-pads from the central portion of the thorax.

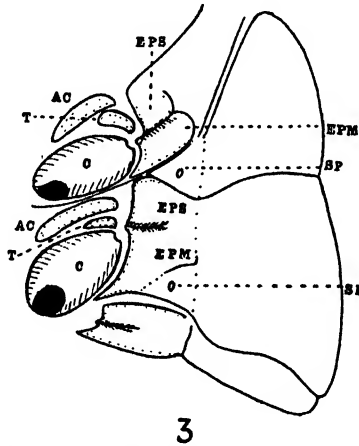


FIG. 3.—*Hemiodocus fidelis*, third instar nymph, thorax, ventral surface. eps., episternum; epm., epimeron; ac., ante-coxale; t., trochantin; sp., spiracle; c., coxa.

*Third Instar.*

In the third instar in addition to dorsal longitudinal sutures being present, ventral ones are also developed. These lie immediately below the dorsal sutures. Fig. 3 represents the ventral surface of the thorax of a third instar nymph of *H. fidelis*, the coxae and accompanying sclerites of the metathorax are not shown. Lying anteriorly to the coxa of the front leg are two small sclerites. These are the trochantin and the ante-coxale. The pleural suture separating the episternum from the epimeron is distinct and the longitudinal suture previously mentioned is well defined as far as the posterior corner of the epimeron. This suture divides the remainder of the prothorax figured into three parts: one of these extends from the base of the episternum and epimeron as far as the eyes, another lies immediately behind the epimeron and bears a spiracle, whilst the third, which is the largest, extends from the suture up to the

lateral margin of the thorax. A comparison of the prothorax with the mesothorax shows that an ante-coxale and trochantin are present on both, that both have a small triangular area of tergal origin bearing a spiracle, but in the prothorax, the episternum and epimeron do not meet the tergal wing-pad as they do in the mesothorax.

The metathorax is considerably reduced but resembles the mesothorax in essential structure.

Myers and China (1929) have described the morphology of the thorax of an adult specimen of *Hemiodocus leai*. The episternum, they misinterpreted as the epimeron and the ante-coxale as the kat-episternum. Later Helmsing and China stated that Mrs. M. D. Haviland Brindley had (*in litt.*) criticised the homologies given by Myers and China. My interpretation is in agreement with that of Mrs. Brindley.

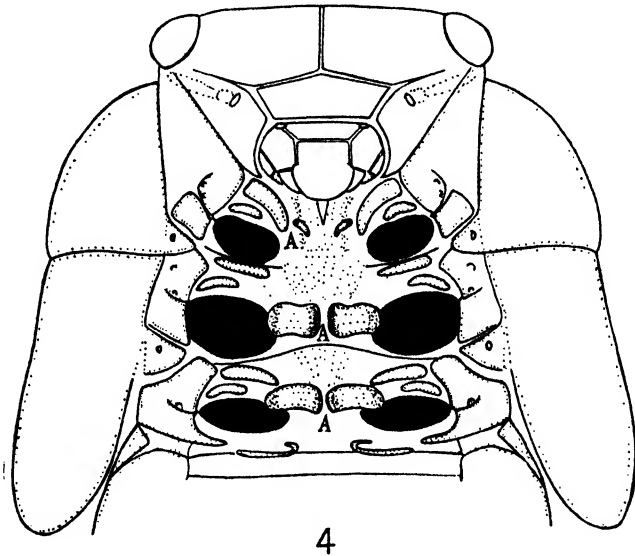


FIG. 4.—*Hemiodocus fidelis*, fourth instar nymph, ventral surface viewed dorsally. A., entosternal arms.

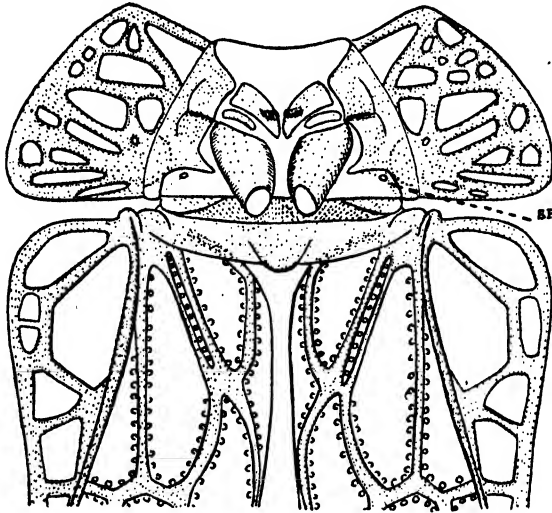
#### *Fourth Instar.*

The fourth or pre-imaginal instar differs from the third in the lengthening of the wing-pads of the mesothorax and in the almost total disappearance of metathoracic wing-pads.

Fig. 4 represents the head and thorax of a nymph of *H. fidelis* in the pre-imaginal instar, the ventral surface being viewed from above. Lying slightly on each side of the middle line in each segment is a pair of projecting arms that arise from the eusternum. These are entosternal arms which in most pterygote insects arise from a common median base and are not separated as shown in the figure. The processes belonging to the prosternum are smaller than those in the other segments and were believed by Myers and China to be an episterna and by Mrs. Brindley to represent the anterior laterale. In the prothorax the basisternum and eusternum are combined, whilst in the meso- and metathorax only the basisternum is distinct. It is possible that the pair of long narrow sclerites lying against the posterior margin of the metathorax represent the post-coxal bridges, no sign of which remains in the two anterior segments.

*Adult.*

The thorax and part of the tegmina of an adult *H. fidelis* are shown in fig. 5. The longitudinal sutures are no longer apparent, their position being occupied by the line of junction of the paranota with the body of the prothorax. The spiracles of the prothorax now occupy an intersegmental position posterior to the epimera.



5

FIG. 5.—*Hemiodoecus fidelis*, prothorax of adult in ventral aspect.

*Wing Development and Venation.**Prothorax.*

The type of *H. fidelis* and all those specimens that were collected at the same time as the type had paranotal expansions on the prothorax with numerous small areolets (fig. 7, a). Later collections made in other localities yielded individuals no two of which were exactly similar so far as paranotal development was concerned, but the majority appeared to have distinct veins, the venation being reminiscent of that which occurs in nymphal wing-pads of other Homoptera. Examination of fourth instar nymphs killed in formol and mounted in glycerine jelly disclosed the fact that tracheae entered the pronotal wing-flaps, but whilst the tracheae of the mesothoracic wing-pads were found to be constant in number and position, those of the prothorax were variable (fig. 6).

In fig. 7 are shown six examples (a-f) of paranota of *H. fidelis*, the most frequently found type being shown in fig. 7, f. It is suggested that the veins represent a radial or costo-radial group, a distinct media and a cubito-anal group. Fig. 7, g and h, represent the paranota of *Xenophyes cuscus* and *Hemiodoecus leai* respectively for comparison with those of *H. fidelis*.

*Mesothorax.*

The tegmina among the PELORIDIIDAE are of two types, both macropterous and sub-brachypterous individuals occurring. The macropterous type, with which the tegmina are fully developed and overlap apically, is known only from the single male specimen of *Peloridium hammoniorum* from Puerto Toro, Navarin Island, Tierra del Fuego; the other known specimens of *P. hammoniorum* and the species in the other two genera being all sub-brachypterous. The tegmen of the macropterous form of *P. hammoniorum* is shown in fig. 8, a, that of the sub-brachypterous form in 8, b, whilst figs. 8, c and 8, d represent the tegmina of *H. fidelis* and *H. leai* respectively. Without reference to fig. 8, a or to the pre-venational tracheation, it would be impossible to interpret the venation of the tegmina of the sub-brachypterous forms, as has been done in the figures.

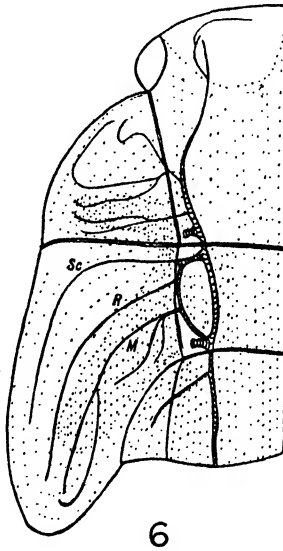


FIG. 6.—*Hemiodocus fidelis*, fourth instar nymph, showing tracheation of the pronotal paranotum and the mesothoracic wing-pad.

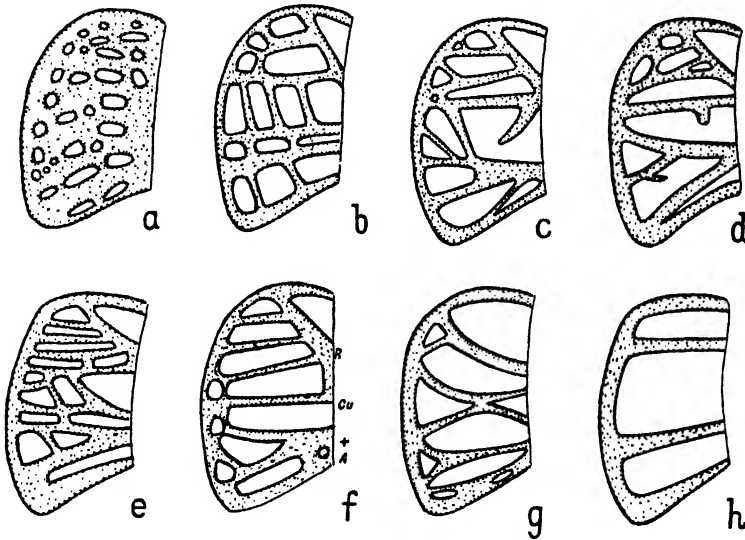
## DISCUSSION.

It is generally accepted that wings arose in the first instance as lateral expansions of the thoracic terga, and it has been suggested by Snodgrass (1935) that the first step in the evolution of paranotal lobes into organs of flight must have consisted in the acquisition of a line of flexibility at the base of each lobe.

Assuming that the longitudinal thoracic sutures already described represent such a line of flexibility, then the pronotal paranota of the PELORIDIIDAE are not secondary developments, such as occur in many other living insects, especially Tingid bugs (e.g. *Stephanitis queenslandensis* Hacker), but represent true wing-flaps such as those possessed by a number of Palaeozoic insects.

Five families of the Palaeodictyoptera had representatives with prothoracic "wings," of which the best known, since it is most frequently figured, is the Carboniferous *Stenodictya lobata* Brongniart. An even better example is the Permian insect, *Lematophora typica* Sellards, of which Tillyard (1928) wrote as follows :—

"The most remarkable part of the prothorax are the two pronotal expansions, homologous with wings. Each expansion is covered all over with an immense number of tiny hairs or microtrichia exactly similar to those found on the wings, and at first sight appears also to possess a series of slender branching veins like those of the wings. Careful examination, however, shows that these apparent veins are not chitinised like true veins, but are the courses of pigment bands carrying slightly larger hairs homologous with the macrotrichia found on many of the true veins of the wings. They are thus in exactly the same condition as the wing sheaths of the last larval instar in many Hemimetabola. There are eight or nine of these radiating pigment bands, of which the larger ones may be branched; some irregular connections also exist between them resembling cross-veins. It is almost certain that tracheae must have underlain these bands."



7

FIG. 7.—a-f, pronotal paranota of *H. fidelis*; g, *X. cascus*; h, *H. lei*.

Wing-like prothoracic lobes occurring on the nymphs of certain Ephemeroptera have been described by Ide (1936). These lobes, which that author considered to be homologous with wing-pads, do not persist in the adult insects.

It is thought that the paired longitudinal thoracic sutures, the alar sutures, are unique amongst living insects. Helmsing and China were uncertain as to their identity, but believed them to be confined to the ventral surface of the prothorax and failed to note their occurrence on the dorsal surface and their continuation on to the meso- and metathorax.

It is a disputed question whether the wing-pads are of tergal or pleural origin, but the balance of opinion supports the view that they are tergal structures. On the basis of this assumption it would appear that the thoracic spiracles of the nymphs of *Hemiodocus* are on ventral extensions of the terga of the pro- and mesothorax. Whilst in many insects the spiracles assume an intersegmental

appearance, particularly in the thorax, being situated just in front of the segments to which they properly belong; they may come to lie on the terga, near the margin of the latter. Thus the spiracles often regarded as belonging to the prothorax pertain in all probability to the mesothorax, having undergone a secondary forward migration. Snodgrass (1927) states that there is much reason, from developmental studies, for regarding the usual first pair of thoracic spiracles as belonging to the mesothorax and the second to the metathorax. He adds, however, that it is disconcerting to observe that the dorsal muscle from the closing lever of the first spiracle of a caterpillar is attached dorsally to the lateral margin of the protergal shield, and still more so to find that there is a spiracle on the prothorax of *Japyx* and related genera in addition to one on the mesothorax.

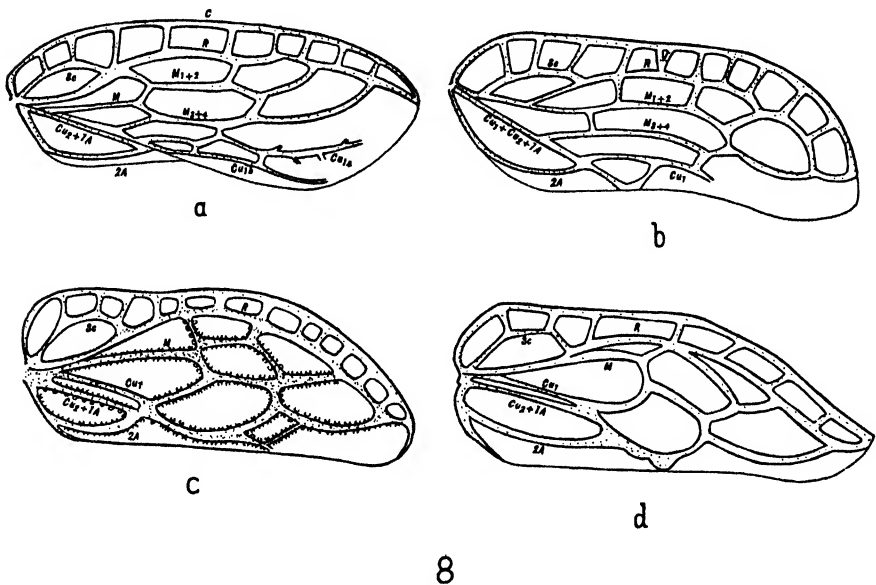


FIG. 8.—a. tegmen of macropterous form of *P. hammoniorum*; b. tegmen of sub-brachypterous form of *P. hammoniorum*; c. tegmen of *H. fidelis*; d. tegmen of *H. leai*.

Two alternatives are possible to explain the position of the thoracic spiracles in *Hemiodocus*. Either that its immediate ancestor had three pairs of thoracic spiracles and that the pair belonging to the metathorax was lost following the degeneration of the hind-wings, or that it had the usual two pairs in the meso- and metathorax and that, as a result of the cessation of development of hind-wings and the retention of the tracheation of the pronotal paranota, both pairs of spiracles shifted forwards. The latter explanation is the more probable because the spiracles lie at the hind border of the pro- and mesothorax, and in other Homoptera they lie close to the anterior margin of the meso- and metathorax. Also in *Lepisma saccharina* L., Sulc (1927) has shown that although tracheae enter the lateral thoracic tergal outgrowths of each of the three segments of the thorax, the two pairs of spiracles are situated close to the anterior margin of the meso- and metathorax.



Apart from *Hemiodoecus fidelis* and *Xenophyes cascus* the venation of the paranota of the PELORIDIIDAE conforms to one type, three cells and two veins being developed. The variation apparent in *H. fidelis* may be because the veins of the paranota have but little supporting and strengthening function. The courses of the principal wing-veins are determined to a certain extent by the tracheae, and their position is in part determined by their function as wing-braces. Hence, where there is no function of support it is not surprising to find that as the tracheae are not constant in position, neither are the veins.

The venation of the tegmen is of an unusual type and bears no very close relationship to that of any known living or fossil insect. Certain of the Fulgoroidea have a development of Cu, as shown for the macropterous form of *P. hammoniorum*, but the presence and position of the sub-costal vein is more reminiscent of the wings of Permian psocids figured by Carpenter (1932) than of those of any known Homoptera.

Quite apart from the retention of pronotal paranota, the thorax of *Hemiodoecus* displays several other primitive characters, both in the sternal and pleural region. The entosternal arms (fig. 4, A) have already been mentioned as of interest, as they do not arise from a common median base. Likewise the presence of the separate components of the anterior coxal bridge is unusual, and although a trochantin is retained by many groups of insects, in the Homoptera it is only with certain Fulgoroidea that the ante-coxale has been observed as a distinct sclerite.

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## INTERNATIONAL COMMISSION ON ZOOLOGICAL NOMENCLATURE

NOTICE OF POSSIBLE SUSPENSION OF THE RULES OF  
NOMENCLATURE IN CERTAIN CASES (A.(n.s.)1)

IN accordance with a Resolution adopted by the International Zoological Congress at their Ninth Meeting held at Monaco in 1913, prescribing that not less than one year's notice is to be given by the International Commission on Zoological Nomenclature of all applications received for the "Suspension of the Rules," the attention of the zoological profession is hereby invited to the fact that requests for the "Suspension of the Rules" have been received by the Commission in the undermentioned cases :—

(a) ECHINODERMATA.—*Diadema* Humphreys, 1797 (type *Echinometra setosa* Leske, 1778) to be added to the Official List of Generic Names (see Mortensen, 1937, *Ann. Mag. nat. Hist.* (10) **19** : 463–469) (reference Z.N. (S.) 52).

(b) INSECTA, Neuroptera.—To be added to the Official List of Generic Names with types as shown in brackets :—*Hemerobius* Linnaeus, 1758 (*Hemerobius humulinus* Linnaeus, 1758); *Chrysopa* Leach, 1815 (*Hemerobius perla* Linnaeus, 1758) (see Cowley and others, 1937, *Generic Names of British Insects*, Pt. 4) (reference Z.N. (S.) 42).

(c) INSECTA, Lepidoptera.—To be added to the Official List of Generic Names with the type as shown in brackets :—*Actinote* Hübner, [1819] (*Papilio thalia* Linnaeus, 1758) (see Hemming, 1936, *Proc. R. ent. Soc. Lond.* (B) **5** : 56–57) (reference Z.N. (S.) 63).

(d) REPTILIA.—*Bitis* Gray, 1842 (type *Vipera (Echidna) arietans* B. Merrem, 1820) to be added to the Official List of Generic Names, and *Cobra* Laurent, 1768, to be suppressed (see Stejneger, 1936, *Copeia*, **3** : 140) (reference Z.N. (S.) 121).

2. In adopting the Resolution referred to above, the International Zoological Congress expressly stated that their object was thereby to render it possible for zoologists, particularly specialists in the group in question, to present to the Commission arguments for or against the suspension of the rules proposed. Any such representations should be furnished to the Secretariat to the Commission (British Museum (Natural History), Cromwell Road, London, S.W.7) as soon as possible and in any case within one year of this day's date. Every such communication should be clearly marked with the Commission's reference number as given above.

BY ORDER OF THE COMMISSION

(Signed) FRANCIS HEMMING,  
Secretary to the Commission.

Secretariat of the Commission,  
British Museum (Natural History),  
Cromwell Road, London, S.W.7.  
27th June, 1939.

DESCRIPTIONS OF SEVERAL SPECIES OF ANTS (HYMENOPT.)  
TAKEN BY DR. O. W. RICHARDS IN BRITISH GUIANA

By Horace DONISTHORPE, F.Z.S., F.R.E.S.

(Department of Entomology, British Museum (Nat. Hist.))

MYRMICINAE Lepeletier.

Dacetini Forel.

**Rhopalothrix (Rhopalothrix) redux** sp. n.

♂. Head and thorax black, petiole, post-petiole, and gaster dark blackish-brown, antennae, mandibles and legs light brown. Head subquadrate, round from behind eyes, posterior border rounded, vertex higher than rest of head, somewhat rugosely punctured and longitudinally striate, the striae forming raised ridges behind eyes; *clypeus* transverse, convex, anterior border rounded, anterior angles small, sharp; *mandibles* small, external border rounded, masticatory border furnished with 7 or 8 small sharp teeth, apical tooth slightly longer; *antennal carinae* small, but somewhat projecting; *frontal furrow* indistinct; *eyes* round, projecting, situated in front of sides of head; *ocelli* moderate; *antennae* very long, 13-jointed, *scape* short, dilated on internal border, *funiculus* with first joint very short, rounded, following joints elongate, of equal breadth, last joint the longest, and slightly narrowed to apex. *Thorax* convex, similarly but more strongly punctured than head; *pronotum* transverse, rounded posteriorly, anterior angles not prominent; *mesonotum* large, convex, rounded, with a deep shining furrow between it and scutellum; *scutellum* rather flat, narrowed posteriorly; *epinotum* flat, furnished with two strong projecting teeth, deeply excised between them, declivity abrupt and considerably hollowed out; *petiole* with a long peduncle which is furnished with a small tooth on each side before node, *node* sloping anteriorly, dorsal surface slightly hollowed out, shining but finely, closely, and distinctly punctured; *post-petiole* transverse, broader than petiole, and more finely punctured; *gaster* oval, very smooth and shining. *Wings* very dusky, covered with small short scattered hairs, *pterosigma* and *veins* dark brown; one closed *cubital cell*, and a long, practically closed, *radial cell*. *Legs* long. *Long.* 3.3 mm.

BRITISH GUIANA: Kaieteur Savannah, 5.ix.37. Described from a single ♂. Type in British Museum.

*R. redux* is almost certainly a new species; no other species has been recorded from British Guiana, and it is very doubtful that it belongs to any of the few species known from elsewhere in S. America.

Only three males of this genus have been described hitherto: *R. gravis* Mann (1922) Honduras; *R. procera* Emery subsp. *samoana* Santschi (1928) Samoa; *R. kokodensis* Donis. (1935) New Guinea. It is, of course, not one of these.

DOLICHODERINAE Forel.

Tapinomini Emery.

**Iridomyrmex mazaruni** sp. n.

♀. Dirty brownish-yellow, head darker above, gaster blackish with light yellow margins to the segments, legs somewhat lighter, shining, very finely alutaceous, and furnished with very small raised scattered tubercles, whole body covered with scattered outstanding yellow hairs.

*Head* longer than broad, broadest across middle of eyes (the sides of the head being visible on outer side of eyes when viewed from above), evenly rounded posteriorly, gradually narrowed anteriorly, posterior border slightly excised; *clypeus* broad convex, anterior border apparently straight, but when viewed from in front slightly sinuate at sides and just before centre, slightly longitudinally striate; *mandibles* large, triangular, with scattered punctures furnished with a number of not very sharp teeth on terminal and internal border, apical tooth being the longest; *frontal area* indistinct; *frontal furrow* short and very faint; *frontal carinae* widely separated, with a narrow raised ridge slightly convergent posteriorly; *eyes* large, oblong oval, convex, with rather large facets, situated in middle above the sides of the head; *antennae* long, scape extending for about  $\frac{1}{3}$  of its length beyond posterior angle of head, *funiculus* gradually and slightly thickened to apex, first and last joints the longest and about equal, the rest of equal length. *Thorax*: *Pronotum* about as long as broad, broadest behind middle, rounded at sides, narrowed anteriorly, forming a neck; *mesonotum* slanting towards the deeply impressed suture between it and epinotum; *epinotum* nodiform, higher than pro- and mesothorax, dorsal surface longer than broad, narrowly margined at sides and base, the latter rounded and forming two small projections when viewed from the side, longer than declivity, declivity abrupt, slightly concave; *petiole* bluntly pointed, rounded anteriorly, slightly concave and narrowly margined posteriorly, not nearly as high as epinotum, scarcely as high as base of gaster; *gaster* short oval; *legs* long. *Long.* 4.2 mm.

♀. Colour, hairiness, sculpture, etc., much as in ♂. *Mandibles* more massive, teeth blacker; *clypeus* with striation more marked, and also those above eyes; *frontal area* distinct, *frontal furrow* longer and more marked; *ocelli* present. Projections to *epinotum* more marked; *gaster* longer and more voluminous. *Long.* 6.5 mm.

BRITISH GUIANA: Mazaruni Clearing. Described from a dealated female and many workers taken by O. W. Richards in an old *Polybia* nest. 17.ix.37. Type and ♀ type in British Museum. This very distinct species is unlike any other S. American *Iridomyrmex*.

#### FORMICINAE Lepeletier.

##### Plagiolepidini Forel.

#### *Acropyga (Rhizomyrma) borgmeieri* sp. n.

♂. Pale brownish-yellow, head somewhat darker, legs and antennae lighter, very finely punctured, shining, clothed with decumbent pubescence, especially on the gaster, and longer and shorter, suberect hairs. *Head* transverse, evenly rounded from behind eyes to posterior border, posterior border very slightly sinuate in centre; *clypeus* transverse, convex, anterior border evenly rounded; *frontal area* distinct; *frontal furrow* shallow, reaching median ocellus; *eyes* large, hemispherical, projecting, occupying nearly half the side of the head; *ocelli* moderate; *mandibles* slender, arched, with three teeth to the masticatory border; *antennae* 12-jointed, fairly long, *scapes* extending a little beyond posterior angles of head, *funiculus* with 1st joint triangular, about as broad as long, broader than joints 2-7, which are transverse, the rest longer, last joint a little longer than the two preceding taken together. *Thorax* convex; *mesonotum* rounded anteriorly, overreaching the *pronotum*; *scutellum* transverse, slightly convex; *epinotum* convex, rounded without marked declivity; *petiole* nodiform, with a blunt rounded point above, slightly convex anteriorly, concave posteriorly and narrowly margined; *gaster* with genitalia somewhat elongate; external *genitalia* very large and prominent, *stipes* long, curved and furnished with a triangular hook,  *volsellae* short and hooked, *sagittae* narrow with blunt turned-up

apex. Wings translucent, covered with minute hairs, *pterostigma* and veins pale brownish-yellow, no *discoidal cell*, one *cubital cell* and closed *radial cell*. Long. 2.2 mm.

BRITISH GUIANA: Mazaruni Clearing. Described from two males. 14.viii.37. Type in British Museum.

In my paper on *Acropyga* (*Rhizomyrma*) *robae* Donis. (1936), I gave a table including all the known species of neotropical *Rhizomyrmae*, with the date of the description of the species, patria, length, number of joints of the antennae and teeth to the mandibles in the workers, females, and males. *R. borgmeieri* comes nearest to *R. rutgersi* Bunzli (1935) Surinam, and *R. dubita* Wheeler & Mann (1914) Haiti, with 12 joints to the antennae and 3 teeth to the mandibles in the male. It is considerably smaller than the former, and somewhat larger than the latter, besides differing in other particulars. Named in honour of Father Borgmeier who has described several species of *Rhizomyrma*.

#### BOOK NOTICE.

*Nomenclator Zoologicus*. A list of the names of genera and subgenera in Zoology from the tenth edition of Linnaeus 1758 to the end of 1935. Edited by S. A. NEAVE. 4 vols. 8vo. London (The Zoological Society of London). 1939→. £8 8s. Vol. 1. A-C, pp. xiv + 958.

Five years ago Dr. S. A. Neave approached the Zoological Society of London and drew attention to the great difficulties in which systematists found themselves in the absence of a complete and up-to-date list of the generic names used in Zoology.

The result of the approach is the appearance of the first of the four volumes prepared under the editorship of Dr. Neave in the Publication Office of the Imperial Institute of Entomology at 41 Queen's Gate. The remaining volumes of the work are promised at six-monthly intervals and the cost of the whole is 8 guineas.

The complete work will contain over 225,000 entries, of which over one-half appertain to the Insecta. In the preparation of the work Dr. Neave has been assisted by the staff of the Zoological and Geological Departments of the British Museum.

For each name included the original reference to its first use is given, and for the period after Dr. Sherborn's *Index Animalium*—i.e. 1851-1935—many of the references have been checked with the original.

An important feature of the work is the inclusion of some 18,000 cross-references to names proposed to replace homonyms.

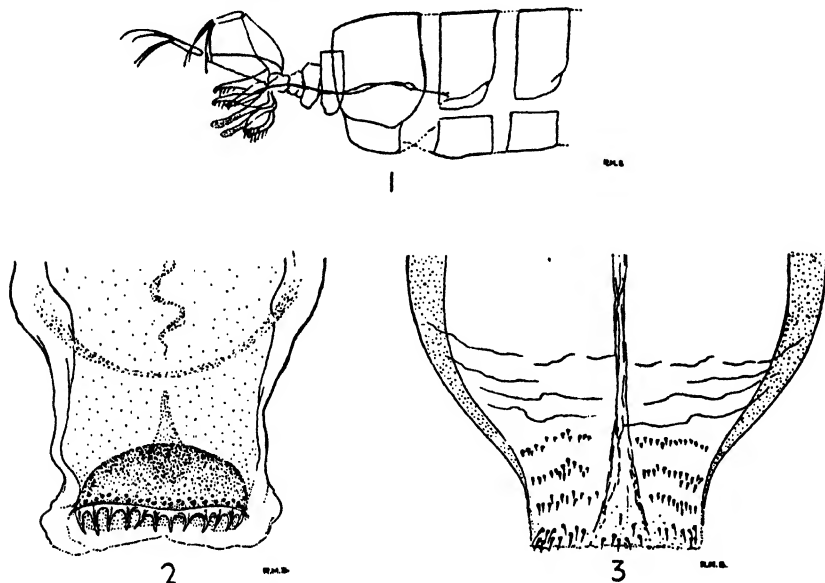
## THE OCCURRENCE OF *PHLEBOTOMUS CLYDEI* IN AFRICA (DIPT.)

By D. J. LEWIS, F.R.E.S., and R. KIRK.

(From the *Stack Medical Research Laboratories, Khartoum.*)

DURING a survey of sandflies in the kala-azar areas of the Anglo-Egyptian Sudan in 1938 *Phlebotomus clydei* Sinton was found in several places in the Blue Nile and Kassala provinces. This species was described by Sinton (1928) from specimens from Waziristan, and Sinton (1932) subsequently recorded that it was widely distributed in the plains of India. The occurrence of this species in Africa is of particular interest in view of Theodor's (1938) observations on the close correspondence between the Indian and East African sandfly faunas.

African females hitherto examined have slightly fewer pointed buccal teeth than the type. The following notes show other small differences from the type with regard to the degree of variation in relative measurements. Where exact figures are given they refer to ten specimens in each case.



FIGS. 1-3.—*Phlebotomus clydei* Sinton from the Sudan: 1, posterior abdominal segments of male; 2, buccal armature of female; 3, pharyngeal armature of female.

### *Male P. clydei from the Sudan.*

Buccal cavity, pharynx, antenna, palp and hind leg with structure and relative measurements as in type. Wing: about four times as long as broad. Ratio  $\alpha$  over  $\beta$  0.55 to 0.97,  $\delta$  over  $\alpha$  0.06 to 0.79,  $\beta$  over  $\gamma$  0.76 to 1.09 and  $\beta$  over  $\epsilon$  0.63 to 0.94. Terminalia: approximately as in type. Proximal segment of superior clasper 2.1 to 2.5 times as long as distal segment. Two of the distal segments of the abdomen markedly smaller than those anterior to them (fig. 1).

*Female P. clydei from the Sudan.*

Buccal cavity : resembles that of the type form except that it has only 12 to 14 pointed teeth. The small nodular teeth near the base of the pointed teeth are arranged in two rows, the anterior row being either well defined or merely represented by a few teeth. Pharynx : armature as in type. Length 2.6 to 2.9 times breadth. Antenna : geniculate spine formula as in type. Total length 8.2 to 9.1 times third segment. Palp and hind leg : approximately as in type. Wing : about four times as long as broad. Ratio  $\alpha$  over  $\beta$  is 0.61 to 0.97,  $\delta$  over  $\alpha$  0.14 to 0.61,  $\beta$  over  $\gamma$  0.66 to 0.98 and  $\beta$  over  $\epsilon$  0.64 to 0.90. Genitalia : spermatheca and post-genital ridge as in type.

*The relation of P. clydei to a species from Agur.*

The male of a species of *Phlebotomus* from Agur, Koalib, Kordofan Province, was described but not named by Theodor (1933). This somewhat resembles *P. clydei* but differs in several points, including the possession of an unarmed pharynx and an intromittent organ with two distinct basal processes. In these respects it resembles the Abyssinian *P. vagus*, recently described by Parrot and Martin (1939), and may be an aberrant individual of this species.

*Distribution and Habits.*

We have found *P. clydei* at Wad Medani, Um Sunt (near Wad Medani). Managil and Singa in the Blue Nile Province and Wad Arud in Kassala Province. It occurs both in inhabited and uninhabited areas and near and far from rivers. It has been collected in houses and in the burrows of *Vulpes pallida* Cretz., *Gerbillus pygargus* Cuv. and other animals.

Mammalian blood has been found in specimens of *P. clydei* from burrows.

We are much indebted to Professor P. A. Buxton for allowing us to study *P. clydei* at the London School of Hygiene and Tropical Medicine, to Col. J. A. Sinton for lending us the type specimens, and to Dr. R. M. Buchanan for the drawings reproduced in figures 1 to 3.

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# THE EXTERNAL FEATURES OF THE EARLY STAGES OF *SPATHIOPHORA HYDROMYZINA* (FALL.) (DIPT., CORDYLURIDAE)

By J. F. GRAHAM, M.Sc.

Communicated by Dr. Ll. LLOYD, F.R.E.S.

## INTRODUCTION.

*S. hydromyzina* is related to the Yellow Dung Fly, *Scatophaga stercoraria* (L.) the life history and habits of which have been described by Cotterell (1920). In the same family the larva of *Hydromyza confluens* Loew, a form highly specialised for life within the petioles of water-lilies, has been considered by Welch (1914) from the bionomic standpoint, whilst Hickman (1935) has described its external features.

*S. hydromyzina* is of interest as the only successful colonist of the sewage bacteria beds amongst the higher Diptera. It abounds there in vast numbers sometimes and the imago is to be found from spring to autumn about all the sewage works in the neighbourhood of Leeds. It preys on the Chironomids and Psychodids which breed in these places, and on suitable days the method of feeding can be readily observed. The victim is stalked, pounced upon, its body wall is rasped away and the contents sucked out. The larva grazes over the medium, devouring the algal and fungal growth. Excess of water causes the larvae to rise to the surface where they preserve their buoyancy by gulping down air into the gut, the anterior part of which always contains some gas. This habit is an adaptation to life in an environment subject to flooding.

The insect is easily reared in captivity by the culture method used by Lloyd (1935) for other sewage insects. A pair taken *in copula* is placed in a tube with a fragment of the algal bed growth *Phormidium*. Eggs are laid on this and as the larvae grow the culture is transferred to a jar with scalded *Phormidium* resting on wet cotton wool. At 15° C. oviposition takes place the second day after mating, and incubation of the egg occupies two or three days. The first ecdysis occurs on the fourth day after eclosion, the second on the tenth day, with pupation about the twenty-third, or twenty-fourth day. At this temperature the pupal period occupies about fourteen days, but the insect appears to overwinter normally as a pupa, since few of other stages can then be found.

## THE EGG.

The eggs (fig. 1) are white in colour with a glistening sheen, and a full batch consists of 80–120 laid in rows on the alga. The egg is cylindrical with rounded ends and measures about 0.85 by 0.28 mm. The upper side is almost flat, and bears along its entire length two flanges which protrude almost radially and so appear foreshortened when viewed from above. At the micropylar end they are widely separated, but converge slightly behind. The micropyle lies in a slight depression. The chorion is roughened by minute tubercles in diamond-shaped reticulations.



This egg is smaller than that of the dung fly, and the flanges in the latter are restricted to the anterior end (Cotterell, 1920) the egg being inserted obliquely into the fresh dung. The function of the flanges is to prevent the egg from sinking in semifluid medium, and it may be mentioned that the eggs of *Fannia* (ANTHOMYIDAE) are similarly provided.

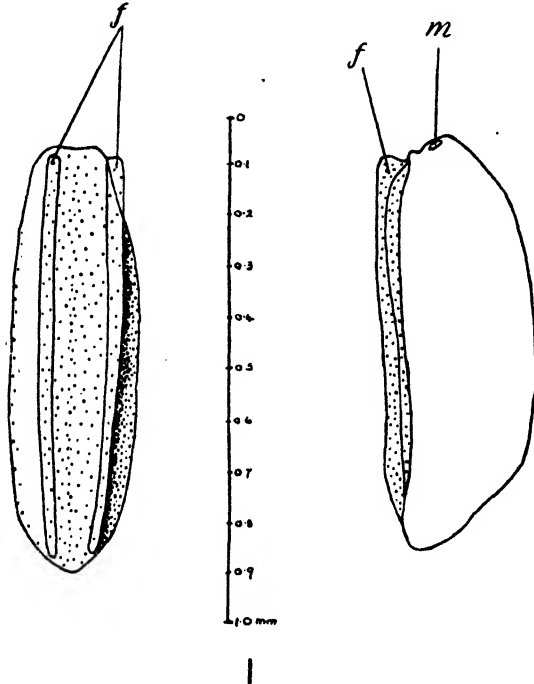


FIG. 1.—The Egg. f = longitudinal flanges; m = micropyle.

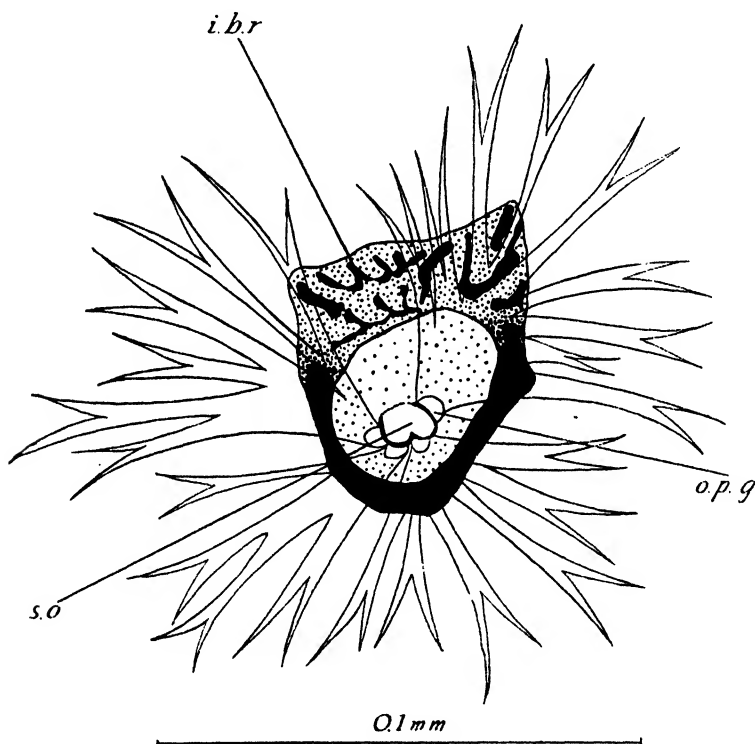
#### LARVA, FIRST INSTAR.

On hatching the larva measures less than 1.0 mm. in length, but grows to 2.0 mm. before the moult. The head is bilobed ventrally, the groove leading to the mouth. Each lobe bears an apical antenna, which is an acorn-shaped peg on a short base strengthened by a sclerotised ring. Posterior to this the palp consists of a number of papillae grouped on a raised area. Three large and nine small papillae compose one group and two others occur on separate protuberances on its aboral side. The buccal sclerites are without teeth and fairly stout. Anteriorly the intermediate sclerites are broad and twisted, but become more slender towards the pharyngeal sclerites. These are broad, though their posterior arms are more slender than in later instars. Ventrally just behind the mouth there are six transverse rows of very strong spines, relatively long. They are set close together on broad bases and apparently afford a purchase during grazing.

The truncate posterior end of the larva is margined by ten conical lobes. Respiration is metapneustic and the spiracles are large, domed and heavily pigmented. Each dome has an irregular base and its walls are strengthened by irregularly branching rods. The spiracular opening is slightly to one side and its rim carries an inward projection partly dividing the orifice. There are

the usual four peristigmatic glands provided with the fan-like branched processes commonly found in larvae of this type (fig. 2). These are very large and the tips of the branches are finely pointed. They are hydrofuge in nature, probably deriving this property from the secretion of the peristigmatic glands (Keilin, 1917). Cupped together they hold an air bubble when the larva is at the surface of the water, and this may function as a physiological lung when the larva submerges (Wigglesworth, 1934). This special habit again seems adaptive to an environment subject to flooding.

The cuticle in this instar is markedly spinous. The spines of the dorsal and ventral surface are short and stout, but the lateral series are longer and hair-like. In the fifth to the eleventh segments, situated laterally near the front margin, is a group of long strong spines with their points directed to a common centre. The colour of this spinous clothing gives the larva a brown appearance. The first instar larva of the dung fly is much less spinous.



2

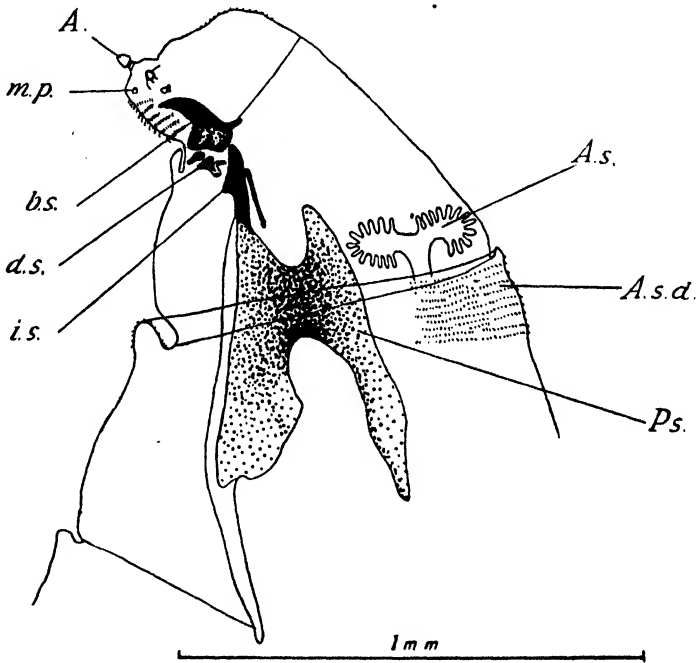
FIG. 2.—Spiracle of first instar; i.b.r. = irregular branching rods; o.p.g. = opening of peristigmatic gland; s.o. = spiracular opening.

#### LARVA, SECOND INSTAR.

During this stage the larva grows from 2.0 to 4.0 mm. in length. The spinescence becomes much less marked, respiration is amphipneustic and the number of anal lobes increases to twelve.

The head is bilobed ventrally and bears in this region eight rows of strong spines with a sensory papilla making its appearance between the second and third rows. On the antenna a small papilla can be detected on the posterior ventral side of the base. On the palp the large group of papillae becomes surrounded by a chitinous ring. The buccal sclerites bear two rows of teeth, four or five in the inner row and two large ones proximally with two small ones distally in the outer row. The posterior ends of these sclerites are slightly forked and the intermediate sclerites are darkly pigmented and a slender rod lies dorsal to them.

The anterior spiracles are bilobed, each lobe having eight to nine processes. The posterior spiracles protrude less than in the first instar and the branched processes are relatively less developed. The orifice of the spiracle is completely divided.



## 3

FIG. 3.—Anterior end of third instar; a = antenna; a.s. = anterior spiracle; s.d. = anterior spines of dorsal region of 2nd segment; b.s. = buccal sclerite; d.s. = dentate sclerite; i.s. = intermediate sclerites; m.p. = maxillary palp; p.s. = pharyngeal sclerite.

#### LARVA, THIRD INSTAR.

During this stage the larva grows from 5.0 to 8.0 mm. The head and sense organs retain their form, but the buccal sclerites are stronger, with longer cutting edges, and without the cleft at the posterior end. The inner cutting edge has eight to ten small teeth and the outer edge bears proximally five large teeth and distally two small ones. The intermediate and pharyngeal sclerites are relatively shorter and stouter than in the second instar (fig. 3).

The digit-like processes on the two arms of the anterior spiracles have increased to about twelve in number. The posterior spiracles have the three openings of oval form and the branched peristigmatic processes are still rather conspicuous structures.

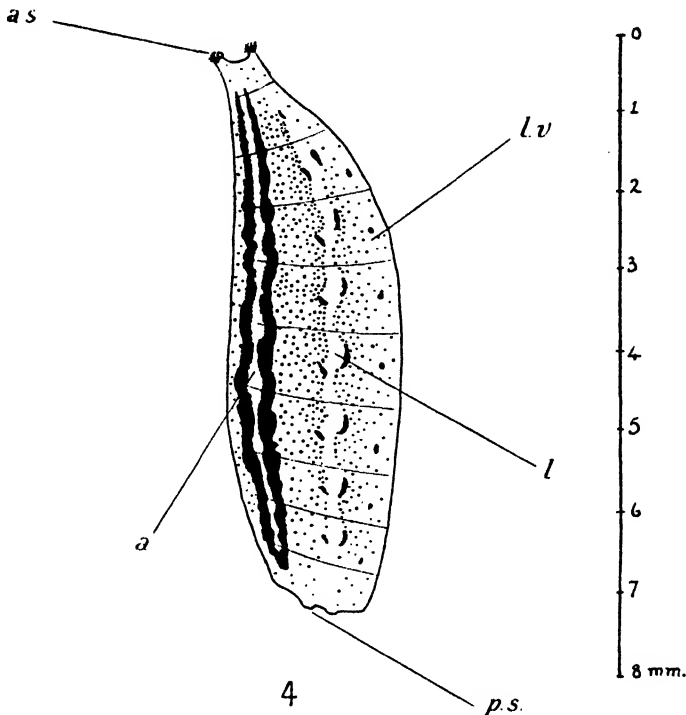


FIG. 4.—The Pupa; a.s. = anterior spiracle; a. = mid-dorsal line; l. = light coloured lateral area; l.v. = light coloured latero-ventral area; p.s. = posterior spiracle.

#### PUPARIUM.

The puparium (fig. 4) is cylindrical, tapering anteriorly and truncate behind with the anterior spiracles very conspicuous. It measures 6.0–7.0 mm. in length and its greatest diameter is about 2.0 mm. It is marked dorsally by two lines enclosing an area of lighter colour. Light bands also run along the case laterally and latero-ventrally respectively and contain darker patches in segments five to ten.

#### CONCLUSIONS.

The distinctive characters of this larva in contrast to those of *S. stercoraria* are as follows :

1. No conspicuous food channels converge to the mouth.
2. It has no locomotory plates on the anterior segments.
3. The dentate sclerites are strongly toothed but almost smooth in *S. stercoraria*.

4. The anterior spiracle lobes have processes on both edges, anterior only in *S. stercoraria*.

5. The peristigmatic processes are much more developed. Cotterell does not mention these in his description and they are in fact only detectable with some difficulty in the dung fly.

6. The dung fly larva does not possess the capacity for holding bubbles of air at the posterior spiracles though Cotterell mentions that in its earlier stages it has the power of clinging at the surface film with these structures when the dung is waterlogged. It is not otherwise buoyant and does not swallow air into its stomach. These two faculties in the larva of *S. hydromyzina* must be regarded as of an adaptive nature and it is possibly owing to their development that the insect has been able to colonise the bacteria beds.

#### SUMMARY.

The early stages and feeding habits of *Spathiophora hydromyzina* (Fall.), (CORDYLURIDAE) are described and points of difference from the allied *Scatophaga stercoraria* are noted. The fly has colonised the beds of sewage works and features in the respiration and buoyancy maintenance of the larva are mentioned as possibly contributing to a successful life in this environment.

#### ACKNOWLEDGEMENTS.

Acknowledgements are due to Dr. Ll. Lloyd and to Prof. E. A. Spaul for various help during this work, also to Mr. J. T. Thompson, Manager of the Knostrop (Leeds) Sewage Works for assistance in obtaining material.

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NEW SPECIES AND SUBSPECIES OF HESPERIIDAE (LEPIDOPTERA)  
OBTAINED BY HERR H. HÖNE IN CHINA IN  
1930-1936

By W. H. EVANS, C.S.I., C.I.E., D.S.O., F.R.E.S.

*Note.* All types, unless otherwise stated, are in the Bonn University Museum. Paratypes of all the species are in the British Museum (Natural History).

1. *Coladenia hoenei* sp. n.

Type ♂ Tapai Shan, Tsinling, S. Shensi, 1700 metres, 26.v.1935.

Appertains to the *vitrea* (Leech) group of the genus *Coladenia*, which species it resembles in wing shape and the presence of hyaline spots on both wings. Above uniform brown, rather paler beyond the discal spots, which are white and tend to have a black edging. Fore-wing above, the spots exactly as in *vitrea*, but in addition to the costal spot in space 11 above the cell spot there is a spot in space 10 nearer the apex and the spots in spaces 4 and 5 are more frequently present. Hind-wing above, the large cell spot is narrower than in *vitrea* and is inwardly concave; discal and subbasal spots smaller and variable, some may be absent: in the type the discal series is composed of 2 small spots in space 1 c, larger in spaces 2, 3 and 4, dots in spaces 5, 6 and 7: subbasal spots are, two in space 1 c, base of space 3 and near base of space 7. Cilia white in space 1 b on fore-wing and on hind-wing in spaces 1 c, 6 and 7. Below as above: on fore-wing two whitish suffused spots in space 1 b beyond the hyaline spots: clothing of thorax and palpi brown, but the base of each eye is conspicuously white. The uniform brown ground colour separates the species at once from *vitrea*. Fore-wing length 22 mm. Female exactly as the male.

3 ♂♂ from the type locality: 2 ♂♂ 3 ♀♀ Tien Mu Shan, Lingan, Chekiang, 1500 metres, June 1931.

2. *Coladenia sheila* sp. n.

Type ♂ West Tien Mu Shan, Chekiang, 1600 metres, 21.v.1932.

Closely resembles *vitrea* Leech. Above blackish-brown: fore-wing as *vitrea*, but the spots in spaces 4 and 5 are prominent (absent in one specimen), as also is the white shaded submarginal band. Hind-wing above, the white markings larger, particularly the discal ones, which are as wide as the large cell spot and more nearly conjoined thereto: the submarginal white shading absent, but with a narrow whitish submarginal band. Cilia white only at the tornus of the hind-wing in space 1 c and in spaces 4 and 5. Below as *vitrea*, but the white shading absent on the hind-wing except at the base of the cell and broadly along the dorsum to the middle of space 1 c. Clothing of body whitish, but the palpi yellow, differentiating the species at once from *vitrea*, where the palpi are grey tipped with black. Fore-wing length 21 mm.

4 ♂♂ from the type locality.

3. *Coladenia dan decora* subsp. n.

Type ♂ Tien Mu Shan, Chekiang.

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Differs from all described forms of *dan* Fabricius in the paleness and prominence of the yellow markings on the hind-wing below: in other forms they are suffused dull ochreous. Above it resembles *fatih* Kollar the N. Indian form and has the same fore-wing length of 18 mm. as against 22 for the large W. China form, *dea* Leech.

13 ♂♂ 4 ♀♀ from the type locality.

#### 4. *Carterocephalus abax patra* subsp. n.

Type ♂ Likiang, N. Yunnan, 15.viii.1935.

Identical with *abax* Oberthur except for the hind-wing below, which is evenly and closely overlaid with dull green scales: there is a longitudinal silver stripe from the base through the cell to the termen and a similar stripe in space 1 a: no trace of any of the spots from above showing through: in *abax* these spots are conspicuous and the silver stripes are barely traceable.

4 ♂♂ from the type locality.

#### 5. *Carterocephalus alcina* sp. n.

Type ♂ Teng-Yueh-Ting, Yunnan: in British Museum.

Above as *abax* Oberthur but the markings are paler and smaller and while in *abax* there is a narrow yellow stripe above the fore-wing costal vein from the base nearly to the cell spot, in ♂ *alcina* the costal area here is entirely yellow and in the ♀ entirely dark or very dusky ochreous. Fore-wing below, as *abax*. Hind-wing below, quite different: ground colour ferruginous with large yellow spots: in addition to the spots that appear above, there are large submarginal spots in spaces 1 c, 2, 3, 6 and 7 and a large central and a smaller basal spot in space 7. Fore-wing length 12 mm. against 15 for *abax*.

Described from a series of 16 ♂♂ 1 ♀ from the type locality from the Joicey collection and standing in the British Museum over a MS. name, awaiting publication. 19 ♂♂ ♀♀ were obtained by Herr Höne at Likiang and Yunnanfu, N. Yunnan, in iii.1935.

#### 6. *Carterocephalus ensis* sp. n.

Type ♂ Likiang, Yunnan, v.1935.

Generally resembles *flavostigma* Oberthur, figured in 1908, *Ann. Soc. ent. Fr.* 77, pl. 5 fig. 5: the yellow markings are darker. Fore-wing above with a broad subbasal yellow band from the costa to the median vein: a broad discal band from the costa to vein 1, partially dislocated outwards at vein 2 and there is a dot in space 3 conjoined to the spot of the band in space 2: an apical band from vein 4 to vein 8, sharply dislocated in vein 6. Hind-wing above a central yellow area as in *flavostigma*, but outwardly extended towards the termen in spaces 4 and 5, the outer part being separated by a thick black line; no subapical spot in space 6 as in *flavostigma*. Fore-wing below, generally as *flavostigma*, but the apex all ferruginous, except for a small yellow apical dot. Hind-wing below variegated ferruginous and yellow, the base being yellow, also the apex, tornus and middle of the disc: cell spot absent: central band as in *flavostigma*, but the submarginal band differently placed and much reduced, the small spots in spaces 2, 3 and 4 being nearer to the central spot than to the termen, the spot in space 5 absent and the spots in spaces 6 and 7 small and equal. Fore-wing 13 mm.

19 ♂♂ from the type locality and Yunnanfu, Yunnan.

7. *Isoteinon lyso* sp. n.

Type ♂ Berg Ost Tien Mu Shan, Lingan, Chekiang, 1500 metres, 25.vii.1931.

A larger species than *lamprospilus* (Felder), fore-wing 22 mm. and with white hyaline spots on the hind-wing as well as the fore-wing. Above dark brown, basally greenish ochreous: cilia pale yellow, broadly chequered brown at ends of veins. Fore-wing above, with two nearly conjoined cell spots, large quadrate spot in space 1 b over vein 1 and not reaching vein 2, large spot in space 2 with its inner edge under the centre of the cell spot, smaller detached spot in space 3, dots much nearer the margin in spaces 4 and 5 and irregular apical spots in spaces 6 and 8. Hind-wing above, a large spot in spaces 4, 5, just beyond the end of the cell and a smaller widely separated spot near the base of space 2 below it. Fore-wing below, black, paler dorsally, costa and apex broadly overlaid greenish ochreous scales, spots as above, but the spot in space 1 b suffused. Hind-wing below entirely overlaid greenish ochreous scales, dorsum blackish and with conspicuous black spots at the base of space 7 and surrounding the discal spots on both sides.

4 ♂♂ 5 ♀♀ from Tien Mu Shan, Chekiang. A very remarkable new species.

8. *Ampittia dalai-lama jesta* subsp. n.

Type ♂ Tien Mu Shan, Chekiang.

Smaller than *dalai-lama* (Leech) from W. China: fore-wing length 11 mm. against 13 mm. for the latter. Markings on the fore-wing above much reduced and on the hind-wing absent: markings on the hind-wing below more complete and regular. The form *jesta* flies in Chekiang with *nanus* Leech and resembles it very closely, but *nanus* can be distinguished by the markings on the hind-wing below being white instead of yellow, while on the fore-wing below the spots in spaces 4 and 5 are present in *nanus* and absent in *jesta*. The genitalia of the two species differ only in the ventral aspect of the uncus: it is rounded in *nanus* and spear-shaped in *dalai-lama*.

10 ♂♂ 9 ♀♀ Tien Mu Shan, Chekiang.

9. *Erionota alsatia* sp. n.

Type ♂ Likiang, N. Yunnan, 21.vii.1934.

Generally resembles *grandis* (Leech), but the fore-wing is more rounded, length 26 mm. On the fore-wing above, the white spots in the cell and space 2 are larger and contiguous, no apical spot and the ground colour at the apex is paler. Fore-wing below, apex and termen broadly paler. Hind-wing below uniform brown, not centrally paler as in *grandis*. Antennae in front white throughout.

7 ♂♂ 9 ♀♀ from the type locality.

10. *Halpe zinnia* sp. n.

Type ♂ Likiang, N. Yunnan, 16.v.1935.

Appertains to the *aina-gupta* group characterised by the prominent double whitish pouch on the fore-wing above, below the origin of vein 2. Above silky dark brown, cilia grey. Fore-wing above with very pale yellow hyaline spots in spaces 2 and 3 as in *aina* de Nicéville and decreasing apical spots in spaces 6 and 7: also a small upper cell spot. Fore-wing below, black, costa and apex dull ochreous. Hind-wing below dull ochreous, dorsum black and small obscure brown spots near the bases of spaces 2 and 3. Palpi



below dull yellow. Antennae chequered in front, dull yellow below. Fore-wing length 16 mm.

20 ♂♂ from the type locality.

### 11. *Ochlodes linga* sp. n.

Type ♂ Central China : in British Museum with a manuscript name awaiting description. Herr Höne obtained 56 ♂♂ ♀♀ at Tapaishan, Tsinling, S. Shensi and in Tien Mu Shan, Chekiang.

Above orange with broad dark terminal borders on the hind-wing. Fore-wing above with a narrow band, grey centred, and some dark shading below the cell and basal to the band : the dark border penetrates in spaces 4 and 5 to the dark bar at the end of the cell, leaving an orange streak over the yellow sub-hyaline spot in space 3 and reaches the costa, thereby isolating the spots in spaces 6 to 9 : otherwise the sub-hyaline spots are as in *subhyalina* (Bremer and Gray), viz. those in spaces 2 and 3, the two cell spots and the apical spots, the spot in space 1 b being opaque. Hind-wing above the inner edge of the dark margin is crenulate : the broad central orange area reaching the base separates *linga* at once from *subhyalina*. Below greenish ochreous, becoming orange in the cell of the fore-wing : on the fore-wing there is a broad subternal black area in spaces 1 b and 2, space 1 a being entirely black ; also there is a dark area behind the pale spot in space 2, which extends to vein 1 and to the base of space 1 b. Hind-wing below traces of pale yellow discal spots in spaces 2, 3 and 6 : veins not darkened. Fore-wing length 16 mm. In the female the bases are darkened as in *subhyalina* from which it can be recognised by the spot in space 4 of the fore-wing overlapping the spot in space 3 and usually the spot in space 5 overlaps the spot in space 6.

### 12. *Ochlodes lanta* sp. n.

Type ♂ Lou Tse Kiang, W. China : in British Museum, where there are 7 ♂♂ from the type locality, 5 ♂♂ from Tsekou, W. China, and 1 ♂ 1 ♀ from Yunnan. Herr Höne obtained 4 ♂♂ from Likiang, N. Yunnan.

♂. Above dark brown with dull orange suffusion to the middle of the fore-wing and on the disc of the hind-wing : band as usual, narrowly centred dull grey. Fore-wing above opaque double yellow spot in cell, spot in space 2 overlapped by a small spot at the base of space 3 : typically no apical spots or spot in space 1 b, but in some specimens a streak is present over vein 1 and apical spots in spaces 6 to 8. Hind-wing above typically without spots, present in spaces 2 and 3 in a few specimens. Fore-wing below entirely ochreous except for a dark area behind the spot in space 2 and below vein 2. Hind-wing below uniform ochreous, typically with a small dark spot in space 2 and an obscure dark dot in space 3, both of which may be absent. Fore-wing length 17 mm. ♀ above uniform dark brown, with pale yellow hyaline discal spots on the fore-wing, double cell spot, quadrate spot in space 2, small detached spot in space 3 and a dot in space 6 : below as ♂.

Generally resembles *O. subhyalina* (Bremer and Gray).

ON SOME NEW SPECIES OF AFRICAN PTEROSTICHINI  
(COL. CARAB.). PART 1

By S. L. STRANEO.

(Parma, Italy.)

Communicated by Mr. E. B. BRITTON, F.R.E.S.

RECENTLY I received for determination from the Imperial Institute of Entomology, from the British Museum and from Dr. Fritz van Emden a considerable number of African Pterostichini. I found among them some new species and I give here their descriptions.

I have to thank Sir Guy A. K. Marshall and Mr. E. B. Britton and Dr. F. van Emden for the communication of this interesting material and for the duplicates generously presented to my collection.

***Abacetus profundestriatus* sp. n.**

Long. 12.4 mm., max. lat. 5.0 mm. Colore nigro profundo, levissime iridescente, pedibus brunneo-rufescentibus, antennis parum clarioribus; marginibus pronoti interdum leviter rufescentibus. Caput sat parvum, oculis parvulis, mediocriter convexis, temporibus brevissimis, sed distinctis; sulcis frontalibus brevibus, fortiter divergentibus, primum porum supraocularem versus; antennis modice elongatis, basim pronoti articulo ultimo superantibus, articulis quarto et sequentibus pubescentibus. Pronotum sat amplum subtrapezoidale; long. 3.3 mm.; max. lat. 4.2 mm.; lateribus antice fortiter rotundatis et constrictis (lat. ant. 2.5 mm.), postice parum convergentibus recte vel subsinuatum; (lat. bas. 3.6 mm.); maxima latitudine in media longitudine; margine antico modice excavato; angulis anticis sat acutis et prominentibus, apice rotundato; angulis posticis fere rectis, apice leviter rotundato; basi utrinque unisulcata, sulcis  $\frac{1}{2}$  longitudinis pronoti, attingentibus, rectis, fere non convergentibus, valde profundis; margine laterali parum spisso, canaliculo laterali angusto, profundo, fere aequalis latitudinis usque ad basim; basi non punctata, portione inter sulcos et marginem lateralem leviter impressa, non marginata; disco parum convexo, linea media impressa, profunda, praecipue in medio, et elongata, marginem anticum fere attingente. Elytra subovalia, modice elongata, valde convexa; long. 7.0 mm.; max. lat. 5.0 mm.; humeris rotundatis, margine basali sat curvatus humeros versus; striis profundissimis, levibus, non crenulatis; interstitiis fortiter convexis, tertio poro distincto in media longitudine praedito, septimo distincte sublato, quasi leviter costato; apice elytrorum sat acute rotundato. Subtus levis, non distincte punctatus, prosterno obtuso, processu non distincte marginato, plano; metepisternis parvis et brevibus, rugosis vel superficialiter subpunctatis, sternitibus ad latera rugosis et impressis, sternite anali maris poro singulo, feminae poris binis utrinque praedito. Pedes regulares, tibiis anticis calcare simplicee non trifido, tarsis mediis et posticis supra striolatis; onychio glabro, subtus setis nullis praedito. Aedeagus ut in fig. 1 instructus. Microsculptura capitis isodiametrica, pronoti parum transversa, elytrorum transversa et angusta.

Habitat: CAMEROON: Batouri District, lat. 3.75; long. 13.75 E.

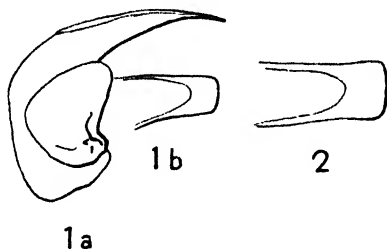
Holotypus ♂ in British Museum; allotypus ♀ in coll. Straneo.

This new species is similar in aspect to *Abacetus uelensis* Burg., but the base of the pronotum is not margined, the shoulders are rounded not dentiform, the striae are less deep and the pronotum less convex.

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*Abacetus vanemdeni* sp. n.

Long. 10.3 mm.; max. lat. 4.2 mm. Colore nigro profundo, elytris, epipleuris et femoribus fortiter azureo-iridescentibus, antennis pedibusque valde obscuris, fere nigris, palpis ferrugineis. Subtus subiridescens. Caput sat angustum et elongatum, oculis modicis, parum convexis, temporibus nullis vel fere nullis; sulcis frontalibus profundis, brevibus, sat divergentibus primum porum supraocularem versus; antennis sat robustis, distincte compressis, basim pronoti parum superantibus, articulis quarto et sequentibus pubescentibus. Pronotum subtrapezoidale, long. 2.8 mm.; max. lat. 3.6 mm.; lateribus antice fortiter rotundatis et constrictis, postice fere rectis et perparum angustatis; lat. anter. 2.2 mm., lat. bas. 3.4 mm.; angulis anticis leviter prominentibus, ad collum sat admotis, apice parum rotundato; angulis posticis rectis, apice leviter subtruncato-rotundato; basi utrinque unisulcata, sulcis linearibus, sinuatis et sat fortiter convergentibus antice; margine laterali levi, canaliculo valde profundo, non angusto, postice levissime dilatato; basi non punctata, fere recta, in medio leviter excavata, inter sulcos basales et marginem lateralem leviter marginata; disco convexo, praecipue antice, linea media vix distincta; portione inter sulcum basalem et canaliculum lateralem distincte impressa; impressione producta, quamvis attenuata, secundum canaliculum lateralem, usque ultra dimidiam longitudinem. Elytra subparallelo-ovalia, valde convexa; long. 6.1 mm.; max. lat. 4.0 mm.; humeris parum obtusis, fere quadratis; margine basali modice curvato humeros versus, lateribus parum dilatatis post humeros, dein subparallelis, usque ultra dimidiam longitudinem; striis profundis, levibus, interstitiis convexis, tertio poro, in dimidio basali posito, praedito; apice regularissime rotundato. Subtus proepisternis levibus, metepisternis longis, non distincte punctatis; prosterno longitudinaliter fortiter sulcato, processu distincte marginato; sternitibus primis subpunctato-rugosis; sternite anali maris poro singulo, feminae poris binis utrinque praedito. Pedes regulares, tibiis anticis calcare simplicis, non trifido, tarsis posticis et mediis supra striolatis, onychio glabro, subtus setis nullis praedito. Microsculptura capitis isodiametrica, pronoti parum transversa, fere isodiametrica, elytrorum indistincta in interstitiis, sat crebra in striis. Aedeagi apex maris ut in figura 2 instructus.



FIGS. 1-2.—1. Aedeagus of *Abacetus profunderstriatus* sp. n. a, profile; b, apex; 2. Apex of the aedeagus of *Abacetus vanemdeni* sp. n.

Habitat: LAKE VICTORIA: Ins. Ukerewe (*P. A. Conrad's*): 3 examples.

Holotypus ♂ et paratypus ♀ in coll. van Emden: allotypus ♀ in coll. Straneo.

This new species is rather similar to *Abacetus procax* Tschit., but at once distinguishable by the larger size, antennae and legs darker, first segment of antennae blackish (in *procax* ferrugineous) etc. It is also nearly allied to *A. pavoninus* Péring., but the pronotum is less rounded at the sides and less constricted behind.

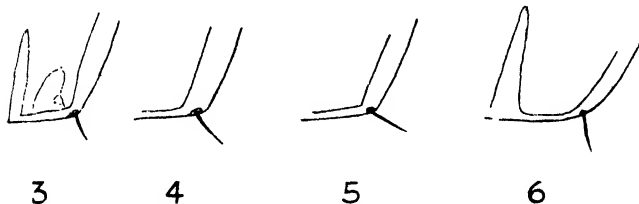
**Abacetus major** sp. n.

Long. 10.6 mm.; max. lat. 4.0 mm. Colore brunneo, interdum piceo, fortiter iridescente, palpis, antennis, pedibus et portione inferiore corporis omnino ferrugineis. Caput sat angustum et elongatum, oculis sat amplis, modice convexis, temporibus nullis, sulcis frontalibus brevibus, primum porum versus divergentibus; antennis sat subtilibus, articulo ultimo basim pronoti superantibus, articulis 4° et sequentibus pubescentibus. Pronotum subtrapezoidale; long. 2.8 mm.; max. lat. 3.5 mm.; lateribus regulariter et sat fortiter rotundatis, antice quam postice magis constrictis; lat. ant. 2.1 mm.; lat. bas. 2.6 mm.; margine antico sat fortiter arcuatim excavato; angulis anticis acutis, a collo sat amotis, apice rotundato; posticis obtusis, late rotundatis, ut in fig. 2 instructis; margine laterali subtili, canaliculo antice perangusto, leviter et gradatim dilatato usque ad basim; basi sulco angusto et sat elongato utrinque praedita, inter sulcos leviter punctato-rugosa, intra sulcos et canaliculum lateralem leviter convexa, non impressa; disco modice convexo, linea media subtili sed bene determinata. Elytra ovalia, basi pronoti bene adhaerentia; long. 5.9 mm.; max. lat. 4 mm.; humeris parum prominentibus, rotundatis, margine basali sat fortiter curvato humeros versus; lateribus post humeros gradatim dilatatis, maxima latitudine in media longitudine; apice regularissime rotundato. Microsculptura capitis isodiametrica, pronoti transversa creberrima, elytrorum indistincta. Pedes regulares; tibiis anticis calcare simplici, non trifido; tarsis mediis et posticis supra striolatis; onychio glabro, subtus setis nullis praedito.

Habitat: N.W. RHODESIA: Mwenga (27.40 E., 13 S.) (*H. C. Dollman*): some examples ♀.

Holotypus et paratypi in British Museum; allotypus et paratypus in coll. Straneo.

This new species belongs to the group of *A. nitens* Tschit., *dilucidus* Péring., *parallellicollis* Péring., *pavoninus* Péring. etc., but it is easily recognisable by the size and by the shape of the lateral channel and posterior angles of the pronotum, as figs. 3-6 show.



FIGS. 3-6.—Sketches of the posterior angles of the pronotum of some *Abacetus*. 3, *A. parallellicollis* Péring.; 4, *pavoninus* Péring.; 5, *dilucidus* Péring.; 6, *major* sp. n.

**Abacetus pseudoflavipes** sp. n.

Long. 8.0 mm.; max. lat. 3.2 mm. Colore nigro nitido, elytris interdum levissime brunnescentibus, modice iridescentibus; antennis, palpis pedibusque omnino rufoferrugineis sat claris. Caput sat robustum, oculis modice amplis, convexis, temporibus nullis; sulcis frontalibus brevibus, modice sinuatis, fortissime divergentibus primum porum supraocularem versus, rugosis; antennis sat longis et subtilibus, articulo ultimo basim pronoti superantibus, articulo quarto et sequentibus pubescentibus. Pronotum transversum, subcordiforme; long. 2.0 mm., max. lat. 2.8 mm.; lateribus antice fortiter rotundatis, postice minus curvatis et leviter subsinuatis; lat. anter. 1.7 mm.; lat. bas. 2.1 mm.; angulis anticis parum vel modice prominentibus, posticis obtusis, dente parvo apicali

instructis; margine antico fere recto; canaliculo laterali undique sat angusto et poris binis regularibus praeditis; basi utrinque sulco singulo, sat lato et profundo, fere recto, praedita, non punctata, levissime rugosa prope sulcos, inter sulcos et marginem lateralem convexa, non impressa, et marginata; disco parum convexo, linea media sat lata et profunda. Elytra ovalia, convexa, disco medio fere plano, id est declivio apicali et laterali forti et abrupto; long. 4.8 mm.; max. lat. 3.2 mm.; lateribus post humeros fortiter curvatis, dein subparallelis; maxima latitudine in media longitudine; humeris obtusis, sat rotundatis, margine basali modice curvato latera versus; striis profundis, finissime crenulatis, interstitiis permodice convexis, tertio poro praedito ad  $\frac{2}{3}$  longitudinis posito; apice elytrorum sat regulariter rotundato. Subtus levis, subiridescens, non punctatus; prosterno plano, non sulcato, processu fortiter marginato, metepisternis longis, antice et intus fortiter sulcatis; sternitibus levibus, primis ad latera leviter rugosis; sternite anali maris poro singulo, feminae poris binis utrinque instructo. Microsculptura capitis isodiametrica, pronoti transversa subtilis, elytrorum transversa, crebra. Pedes regulariter elongati, tibiis anticis calcare simplicibus, non trifido; tarsis mediis et posticis supra non striolatis, extus sulcatis; onychio prima visione subtus glabro; sed visione laterali, contra lucem, setis binis tenuissimis et brevibus plerumque instructo.

Habitat: N.W. RHODESIA: Kashitu; Mwenga (*H. C. Dollman*): many examples.

Holotypus ♀ et paratypi in British Museum, allotypus et paratypi in my collection, paratypus in S. African Museum, Cape Town.

Similar in general aspect to *A. flavipes* Thoms., *A. flavipes* var. *severini* Tschit., *A. consors* Tschit., this new species is very distinct in the very flat disc of the elytra and chiefly in the structure of the onychium; it bears underneath only two very fine and very short setae, which can be seen only with difficulty and by lateral observation against a strong light; sometimes the setae are lacking. The onychium therefore seems, in every case, to be glabrous.

#### ***Abacetus zambezianus* Péring. var. *obscurior* var. n.**

A forma typica differt colore virescente potius quam aeneo-aurato, et oculis parum convexis.

Habitat: N. RHODESIA: Mwenga (*H. C. Dollman*): 5 examples.

Holotypus ♂ in the British Museum, paratypus in coll. Straneo.

The differences between the typical form and this new variety are constant, but the species is the same; I have seen an example, from the same locality, intermediate between the typical form and the var. *obscurior*.

#### ***Abacetus validicornis* sp. n.**

Long. 5.5 mm.; max. lat. 2.0 mm.; colore nigro, elytris plus minusve aeneo-virescentibus; antennis brunneo-nigrescentibus, articulis duobus basalibus et basi 3<sup>a</sup> et 4<sup>a</sup> ferrugineis, femoribus nigris, tibiis partim ferrugineis, tarsis ferrugineis. Caput regulare, oculis sat amplis, mediocriter convexis, sulcis frontilibus sinuatis, modice divergentibus, primum porum supraocularem vix superantibus; antennis robustis, elongatis, articulis tribus ultimis basim pronoti superantibus, articulis 4–11 sat dilatatis, compressis et robustioribus, articulis 4<sup>o</sup> et sequentibus pubescentibus. Pronotum subtrapezoidale, parum convexum, long. 1.2 mm.; max. lat. 1.5 mm.; lateribus sat regulariter rotundatis fere usque ad basim; ante basim cum sinuositate levi; angulis anticis obtusis, non prominentibus, rotundatis, posticis modice obtusis, apice dente parvo praedito; canaliculo laterali undique angusto, poris binis regularibus praedito; basi utrinque sulco singulo fere recto et mediocriter elongato praedita, punctis raris sed profundis et conspicuis notata, fere recta; disco

parum convexo, linea media subtili. Elytra sat parallela, parum convexa, elongata; long. 3·4 mm.; max. lat. 2 mm.; lateribus post humeros modice dilatatis, dein parallelis usque ultra dimidiam longitudinem; humeris rotundatis, nec angulatis, margine basali fere recto; striis mediocriter profundis, finissime crenulatis; interstitio tertio poro, in dimidia longitudine posito, praedito; apice sat acuto. Subtus omnino levis, prosterno mediocriter sulcato longitudinaliter, processu distincte marginato; metepisternis longis; sternite anali ♂ puncto singulo utrinque praedito. Microsculptura undique isodiametrica, elytrorum latior. Pedes regulares, tibiis anticis calcare simplici, non trifido, tarsis mediis et posticis supra non striolatis, extus leviter sulcatis, onychio subtus setis subtilibus praedito.

Habitat: KENYA: Nairobi 2 examples (*Dr. Van Someren*).

Holotypus ♂ in British Museum, allotypus in coll. Straneo.

This species is nearly allied to *A. confinis* (Boh.) (= *discrepans* Péring.) and *A. minusculus* Stran. (1938, *Ann. Mus. Genova*, 58: 218); but in *A. confinis* (Boh.) pronotum and elytra are distinctly more convex, the pronotum is more constricted towards anterior angles, the antennae are not evidently thickened; and *A. minusculus* Stran. is smaller, with the antennae slender; the elytra are less metallic.

#### **Abacetus sinuaticollis sp. n.**

Long. 4·5 mm.; lat. 1·75 mm. Colore nigro, saepe leviter brunnescento, elytrorum apice, parva portione apicali suturae, epipleuris ferrugineis; sternitibus tribus ultimis plus minusve ferrugineis; pedibus ferrugineis; antennis ferrugineis, articulis 4–9 plus minusve infuscatis. Caput sat angustum et elongatum, oculis mediocriter amplis, parum convexis, temporibus nullis; sulcis frontalibus modice sinuatis, parum ultra primum porum supra-ocularem se extendentibus; antennis sat subtilibus, articulis 4° et sequentibus pubescentibus. Pronotum subcordiforme, long. 1·1 mm.; max. lat. 1·4 mm.; lateribus antice et postice fortiter constrictis, ante basim fortiter sinuatis, dein fere parallelis; lat. ant. et lat. bas. 0·80–0·82 mm.; angulis anticis non prominentibus, ad collum adhaerentibus, posticis rectis; canaliculo laterali angusto, lineari, punctis binis regularibus instructo; basi utrinque sulco sat brevi, modice convergente, mediocriter impresso, notata, sat fortiter et crasso punctata; disco modice convexo, linea media longa, valde distincta, quamvis subtili et mediocriter impressa. Elytra parallela, sat convexa; long. 2·7 mm.; max. lat. 1·75 mm.; lateribus post humeros sat rotundatis, dein parallelis usque ad  $\frac{2}{3}$  longitudinis; humeris omnino rotundatis, margine basali sat fortiter curvato humeros versus, striis profundis, finissime, fere indistincte crenulatis; interstitiis modice convexis, tertio puncto prope mediam longitudinem praedito; apice regulariter rotundato. Subtus omnino levis, non punctatus, prosterno fortiter sulcato longitudinaliter, processu fortiter marginato, metepisternis longis; sternite anali maris puncto singulo, feminae punctis binis utrinque praedito. Microsculptura capitis et elytrorum isodiametrica, pronoti parum transversa. Pedes regulares, tibiis anticis calcare simplici, non trifido, tarsis mediis et posticis supra non striolatis, posticis extus leviter sulcatis, onychio subtus setis subtilibus praedito.

Habitat: N.W. RHODESIA: Lukanga (*H. C. Dollman*): many examples.

Holotypus ♂ et paratypi in British Museum; allotypus et paratypi in coll. Straneo.

Very near to *A. confinis* (Boh.) but easily recognisable by the strongly sinuate sides of the pronotum and the more slender form.

#### **Abacetus brunneus sp. n.**

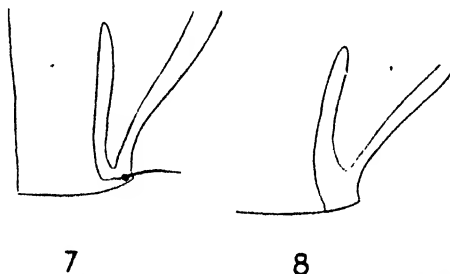
Long. 4·9 mm.; max. lat. 1·8 mm.; colore brunneo, plus minusve obscurato, antennis, palpis pedibusque omnino flavo-ferrugineis. Caput parum elongatum, leve, non punctatum;

oculis sat amplis et convexis, temporibus nullis, sulcis frontalibus modice sinuatis, usque ad secundum porum supraocularem et ultra productis; antennis sat subtilibus, articulo ultimo basim pronoti superantibus; articulis 4° et sequentibus pubescentibus. Pronotum subtrapezoidale, parum convexum, long. 1.3 mm.; max. lat. 1.6 mm.; lateribus antice regulariter et modice arcuatis, postice fere recte convergentibus vel levissime subsinuatis; lat. ant. 1.1 mm.; lat. bas. 1.2 mm.; angulis anticis perparum prominentibus, rotundatis, parum obtusis; posticis obtusis, dente parvo apicali praeditis; margine anteriore fere recto vel levissime excavato; margine laterali ante basim leviter sed distincte crenulato (4-5 parvis denticulis); canaliculo laterali sat angusto et undique uniformi latitudine, poris setigeris binis regularibus praedito; basi utrinque unisulcata, inter sulcos fortiter et grosse punctata, fere recta, ad latera marginata; sulcis basalibus angustis, modice impressis, antice distincte convergentibus; disco modice convexo, linea media subtili. Elytra valde parallela, modice convexa, long. 2.8 mm.; max. lat. 1.8 mm.; lateribus post humeros permodice dilatatis, dein parallelis usque ad  $\frac{3}{4}$  longitudinis; humeris modice rotundatis, margine basali parum curvato, striis sat profundis, finissime crenulatis; interstitiis antice modice convexis, postice planis, interstitio tertio poro in media longitudine praedito; apice leviter acuto. Subtus omnino levis, non punctatus; prosterno antice sulco longitudinali lato et profundo, postice explanato, praedito; processu fortiter marginato; sternitibus levibus, sternite anali maris puncto singulo, feminae punctis binis utrinque praedito. Pedes regulares: tibiis anticis calcare simplicis, non trifido; tarsis mediis et posticis supra non striolatis, posticis extus leviter sulcatis, onychio subtus setis subtilibus praedito. Microsculptura undique indistincta.

Habitat: N. NIGERIA: Azare (*Dr. Ll. Lloyd*) 14 examples (including type); Côte d'Ivoire, Sassandra (*C. Alluaud*) 1 example.

Holotypus ♂ et paratypi in British Museum: allotypus et paratypi in coll. Straneo; paratypus in Muséum National, Paris.

Belongs to the group of *A. aeneus* Dej., *mouffleti* Chaud., *aeneobus* Chaud., *confinis* (Boh.), *minusculus* Stran., *validicornis* Stran. etc.; but may be distinguished at once from those species by the colour, dark brown without any metallic tinge, and yet more by the crenulate sides of the pronotum, near base. The example from Sassandra is only a little darker, but in other respects agrees completely with the examples from Azare.



FIGS. 7-8.—Sketches of the posterior angles of the pronotum of *Abacetes senegalensis* Dej. (fig. 7) and *unisetosus* sp. n. (fig. 8).

### ***Abacetes unisetosus* sp. n.**

Long. 5.7 mm.; max. lat. 2.0 mm. Colore nigro, modice nitido, margine apicali et extremitate suturae elytrorum leviter rufescentibus; sternitibus ultimis et metasterno plus minusve rufescentibus vel ferrugineis; antennis, palpis pedibusque ferrugineis,

praeter articulos 3<sup>um</sup> et 4<sup>um</sup> antennarum nigrescentes, et genua plus minusve infuscata. Caput sat robustum, oculis amplis et convexis, sulcis frontalibus sat brevibus, latis et profundis, divergentibus et sinuatis, primum porum supraocularem superantibus; antennis valde elongatis et subtilibus, articulis quattuor ultimis basim pronoti superantibus, articulis 4<sup>o</sup> et sequentibus pubescentibus. Pronotum fortiter cordatum, basim versus strangulatum; long. 1.2 mm.; max. lat. 1.4 mm.; lateribus fortissime rotundatis, et fortissime constrictis antice et postice; ante basim abrupte sinuatis dein parallelis; lat. ant. 0.8 mm.; lat. bas. vix 0.7 mm.; angulis anticis non prominentibus, ad collum adhaerentibus; angulis posticis rectis; basi non punctata, depressa et rugosa, utrinque unisulcata; sulcis parum obliquis, marginem lateralem attingentibus ante basim; canaliculo laterali angustissimo, lineari, poro setigero anteriore tantum praedito (fig. 8); disco convexo, sulco medio longitudinali lato et profundo. Elytra parallela, convexa; long. 3.3 mm.; lat. 2 mm.; post humeros fortiter et abrupte dilatata, dein parallela; humeris modice determinatis, apice rotundato, obtusis; margine basali fere recto; striis profundis, non punctatis, interstitiis modice convexis, tertio poro in media longitudine praedito; apice sat acuto. Subtus omnino levis, non punctatus; prosterno fortiter longitudinaliter sulcato, processu plano, fortissime marginato; metepisternis longis, intus fortissime sulcatis, antice non sulcatis; sternite anali maris utrinque unipunctato, feminae bipunctato. Pedes elongati, tibiis anticis calcare simplici, non trifido; tarsis mediis et posticis supra non striolatis, posticis extus leviter sulcatis; onychio subtus glabro. Microsculptura undique isodiametrica.

Habitat: LAKE VICTORIA: Ukerewe Ins. (*P. A. Conrads*).

Holotypus ♂ et 4 paratypi in coll. Van Emden: allotypus et 2 paratypi in coll. Straneo.

This species was labelled "*senegalensis* var. *unisetus* nov." in coll. Van Emden, but I think it must be considered a distinct species, though closely allied to *A. senegalensis* Dej., of which I have seen some examples from Bolama (Port. Guinea, leg. *L. Fea*) in the collections of the Mus. Civ. Genova. In *Abacetus unisetosus* the antennae are longer, with the 3rd and 4th segments blackish; the pronotum is distinctly less wide than in *senegalensis*, the basal sulci are different (figs. 7, 8); the want of the seta in the posterior angles of the pronotum is a character of the highest interest and *A. unisetosus* is the only African species known to me which presents such a character. The whole body of *A. unisetosus* is also more slender than that of *A. senegalensis*.

#### ***Abacetus germanus* var. *nigerianus* var. n.**

A forma typica differt elytris minus convexis, genubus magis infuscatis et statura minore: palporum articulo apicali non vel tantum levissime infuscato.

The size of this variety is the same as that of a new variety of *A. germanus* (in the press in *Ann. Mus. Civ. Genova*): var. *nigerianus* differs from this variety by the elytra being less acuminate and less convex towards apex and by the last segment of the palpi not or very little infuscate.

Habitat: N. NIGERIA: Azare (*Dr. Ll. Lloyd*): 16 examples.

Holotypus ♂ et paratypi in British Museum; allotypus et paratypi in coll. Straneo.

#### ***Abacetus pygmaeus* Boh. var. *atripes* var. n.**

A forma typica differt pedibus obscuris, femoribus nigrescentibus, tarsis et tibiis obscure-rufescentibus, colore pronoti et elytrorum nigrescente, fere non metallico.



Habitat : N. RHODESIA : Namwala (*H. C. Dollman*) et N.W. RHODESIA (sine alia nota) (*H. C. Dollman*): many examples.

Holotypus ♂ et paratypi in British Museum; allotypus et paratypi in coll. Straneo.

The examples of *Abacetus pygmaeus* Boh. belonging to this variety are very similar in general aspect to *A. metallescens* Tschit., but in *pygmaeus* var. *atripes* the pronotum is less constricted and less abruptly and strongly sinuate before the basal angles; the colour is less nitid, blackish rather than aeneous-virescent.

### ***Abacetus fuscoringens* sp. n.**

Long. 6.7 mm.; max. lat. 2.6 mm. Colore brunneo-rufescens, plerumque obscurissimo; interdum elytris nigro-piceis; femoribus nigro-rufescentibus, tibiis obscuris, praeter genua clariora, tarsis ferrugineis, antennis brunneo-ferrugineis, articulis tribus basalibus clarioribus, palpis omnino ferrugineis. Caput sat robustum et elongatum, oculis sat amplis, mediocriter convexis, temporibus fere nullis; sulcis frontalibus brevibus, divergentibus, primum porum supraocularem non attingentibus; antennis longis subtilibusque, articulis tribus ultimis basim pronoti superantibus; articulis quarto et sequentibus pubescentibus. Pronotum subcordiforme, sat convexum; long. 1.6 mm.; lat. 1.8 mm.; lateribus regulariter rotundatis per  $\frac{2}{3}$  longitudinis, dein recte convergentibus; lat. ant. 1.2 mm.; lat. bas. 1.3 mm.; angulis anticis ad collum sat admotis, parum obtusis, parum prominentibus, vertice non vel perparum rotundato; angulis posticis obtusis, dente parvo apicali instructis; margine laterali angusto, praecipue antice, poris setigeris binis regularibus praedito; basi punctis parum crebris et parum profundis, sed crassis, instructa, utrinque unisulcata, sulcis sat brevibus et parum convergentibus; disco sat convexo, linea media sat fortiter impressa, praecipue postice. Elytra subparallelo-ovalia; long. 4.1 mm.; max. lat. 2.6 mm.; lateribus post humeros sat rotundatis, dein levissime dilatatis usque ad maximam latitudinem, parum post dimidiam longitudinem positam; humeris late rotundatis, margine basali modice curvatum humeros versus; striis sat profundis, levibus; interstitiis sat convexis, tertio poro in media longitudine praedito; apice elytrorum gradatim rotundato. Subtus levis, non punctatus, prosterno fortiter sulcato longitudinaliter processu fortiter marginato; metepisternis longis, intus et antice sulcato-marginatis. Pedes regulares, tibiis anticis calcare simplici, non trifido; tarsis mediis et posticis supra non striolatis, extus sulcatis; onychio subtus glabro, non setoso. Microsculptura capitis isodiametrica, pronoti parum transversa, elytrorum transversa.

Habitat : N.W. RHODESIA : Lukanga (*H. C. Dollman*) : 13 examples.

Holotypus ♂ et paratypi in British Museum; allotypus et paratypi in coll. Straneo.

This species is rather closely allied to *A. vertagus* Péring. which is at once distinct by the wholly impunctate base of the pronotum; it looks also like *A. inopinus* Péring. but *fuscoringens* is larger, the colour very different etc.

# ON SOME NEW SPECIES OF AFRICAN PTEROSTICHINI (COL.) PART 2

By S. L. STRANEO.

(Parma, Italy.)

## *Abacetus conradsi* sp. n.

Long. 5.4 mm.; max. lat. 1.9 mm. Colore brunneo obscuro, saltem nigrescente, elytris semper clarioribus, saepe omnino brunneo-ferrugineo; pedibus flavo-ferrugineis, antennis brunneo-ferrugineis, articulo quarto parum obscuriore, palpis ferrugineis; subtus brunneus, sternitibus ultimis et sterno clarioribus. Caput regulare, oculis modicis, sat convexis; temporibus nullis, sulcis frontalibus brevissimis, fortissime divergentibus, primum porum supraocularem non attingentibus; antennis modice elongatis, basim pronoti parum superantibus, sat subtilibus; articulis quarto et sequentibus pubescentibus. Pronotum trapezoidale, long. 1.2 mm.; max. lat. 1.5 mm.; lateribus sat fortiter rotundatis usque ad  $\frac{3}{4}$  longitudinis, inde subsinuatis; lat. ant. 1.5 mm.; lat. bas. 1.5 mm.; angulis anticis ad collum sat admotis, non prominentibus, obtusis, parum rotundatis; angulis posticis modice obtusis, apice dente parvo instructo; canaliculo laterali angusto, poris setigeris binis regularibus praedito; basi non punctata nec rugosa, ad latera marginata, utrinque unisulcata, sulcis parum elongatis, sat subtilibus, modice impressis, fere rectis et parallelis; disco parum convexo, linea media elongata, sat angusta sed distincte impressa. Elytra subparallelo-ovalia; long. 5.4 mm.; max. lat. 1.9 mm.; sat fortiter dilatata post humeros, dein subparallela; maxima latitudine in media longitudine; humeris bene determinatis, sed apice rotundato; margine basali humeros versus modice curvatis; striis sat profundis, levibus; interstitiis parum convexis; tertio poro in media longitudine praedito; apice elytrorum parum acute rotundato. Subtus omnino levis, non punctato; prosterno obtuso, non sulcato, processu plano, non marginato; sternite anali maris puncto singulo, feminae punctis binis utrinque instructo. Pedes regulares; tibiis anticis calcare simplici, non trifido; tarsis mediis et posticis supra non striolatis, extus sulcatis; onychio subtus glabro. Microsculptura pronoti isodiametrica fortiter impressa, elytrorum transversa sat lata et conspicua; subtus microsculptura isodiametrica fere undique fortiter impressa.

Habitat: LAKE VICTORIA: Ins. Ukerewe (*P. A. Conrads*).

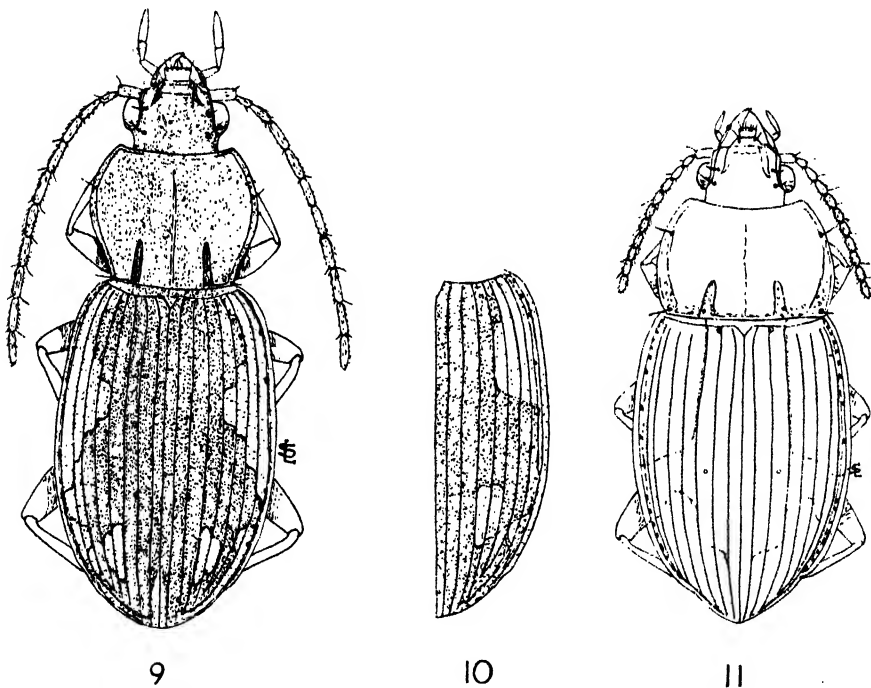
Holotypus ♂ et 4 paratypi in coll. van Emden; allotypus et 2 paratypi in coll. Straneo.

This new species is allied to *A. nanus* Chaud., which is considerably smaller. *Abacetus conradsi* varies in size from 5.0 to 6.0 mm.

## *Chlaeminus variegatus* sp. n. (fig. 9).

Long. 6.4 mm.; max. lat. 2.6 mm.; colore capitis et pronoti supra viridi metallico, elytrorum nigrescente cum maculis flavis ut in figura conformatis; antennis et palpis ferrugineis labro et ore rufescentibus; pedibus flavis, praeter genua, apicem tibiaram et tarsorum leviter infuscat; subtus pro- et metasterno nigro-brunneis plus minusve rufescentibus; abdomine rufescente, sternitibus semper clarioribus, sternitem analem versus; corpus supra omnino punctis finissimis et creberrimis et pubescentia subtili et curta obtectum, ut in speciebus asiaticis generis *Chlaeminus*. Caput modicum, leviter nitidus; oculis sat amplis, modice convexis, temporibus fere nullis; sulcis frontalibus brevibus, fortiter divergentibus primum porum supraocularem versus; antennis longis, subtilibus, filiformibus, articulis tribus ultimis basim pronoti superantibus, articulo secundo ut in gen. *Abacetus* irregulariter inserto; articulis tertio et sequentibus fortiter pubescentibus, etiam primo et secundo setis sparsis instructis. Pronotum sat amplum; long. 1.6 mm.; max. lat. 1.9

mm.; lateribus sat fortiter et regulariter rotundatis usque ante basim, dein subsinuatis; lat. ant. et lat. basis 1.35 mm.; margine antico parum excavato; angulis anticis obtusis, parum prominentibus, apice non rotundato; posticis modice obtusis, apice dente parvo instructo; canaliculo laterali angusto, punctis setigeris binis regularibus praedito; basi non magis punctata quam disco, inter sulcos et latera marginata; disco modice convexo, linea media subtili et sat elongata. Elytra ovalia; long. 4.0 mm.; max. lat. 2.6 mm.; humeris omnino rotundatis, margine basali integro, subtili, humeros versus parum rotundato; striis sat profundis, interstitiis modice convexis, tertio poro singulo, post dimidiam longitudinem posito, praedito, septimo poro conspicuo praeapicali instructo; apice elytrorum sat regulariter rotundato. Subtus proepisternis levibus, prosterno forti sulco longitudinali praedito, processu mediocriter marginato, metepisternis longis, antice, intus et extus sulcatis, lateribus metasterni leviter punctatis; sternitibus leviter pubescentibus, sternite anali maris puncto singulo, feminae punctis binis utrinque instructo. Pedes sat elongati subtilesque; tarsi supra pubescentibus, tarsi anticis maris oblique truncatis; onychio subtus setis subtilibus praedito.



FIGS. 9-11.—9. *Chlaeminus variegatus* sp. n.; 10. *C. senegalensis* sp. n. elytra; 11. *Celioschesis maculata* sp. n.

Habitat: N.W. RHODESIA: Kashitu; Lukanga (*H. C. Dollman*).

The holotype and many paratypes of this interesting species are in the British Museum; the allotype and some paratypes in coll. Straneo.

This species is the first described *Chlaeminus* belonging to the African fauna. All the other species are found in the Indian and Malayan Regions.

I have in my collection two examples of another African species belonging to the genus *Chlaeminus*; and I have found two other examples of the same species among the undetermined *Abacetus* of the coll. Alluaud (Muséum

National, Paris): one of these last examples, which lacks an elytron, is labelled "Chlaeminus Nodieri Oberth. i. litt." I describe this new species below.

**Chlaeminus senegalensis** sp. n.

Very closely allied to *Chlaeminus variegatus*; and I think it sufficient to indicate the measurements of the various parts of the body and the most important differences.

Long. 5.2 mm.; max. lat. 2.0 mm.; long. pronoti 1.1 mm.; max. lat. 1.4 mm.; lat. anter. 0.9 mm.; lat. bas. 1.0 mm.; long. elytr. 3.2 mm.; max. lat. 2.0 mm.

A *Chlaemino variegato* differt statura minore; elytrorum striis minus distincte crenulatis; elytrorum maculis flavis diversis, ut in fig. 10 conformatis; colore macularum et antennarum parum obscuriore.

Though these differences are rather slight, they are very constant. The two species are undoubtedly distinct.

Holotypus ♂ et allotypus in coll. Straneo; 2 paratypi in Muséum National, Paris (coll. Alluaud).

Habitat: IVORY COAST: Dimbroko (Holotype); HAUT SENEGAL: Khayes (Dr. Nodier).

The place assigned by Csiki to the genus *Chlaeminus* in Junk's *Coleopterorum Catalogus* is quite incorrect.

This genus is very nearly allied to *Abacetus* Dej., from which it differs chiefly in the segments of the anterior tarsi of the ♂ which are obliquely truncate, as in *Loxandrus* Lec. All the other characters can be found in different species of the genus *Abacetus*: viz.: the punctation and pubescence of the upper surface of the body is present also in *Abacetus pubescens* Dej., *tschoffeni* Tschit., *palustris* Péring., *gerardi* Burg., etc.; the pubescence of the upper side of the tarsi is present also in *Abacetus stenoderus* Motsch., *piliger* Chaud., *pilosellus* Péring., *gerardi* Burg., etc.; yellow patches of the elytra are also found in *A. quadrisignatus* Chaud. etc., *distigma* Tschit. (I mention only African species.)

**Celloschesis maculata** sp. n. (fig. 11).

Long. 5.5 mm.; max. lat. 2.3 mm. Colore nigro, pronoti disco brunneo plus minusve obscuro, margine laterali, margine basali et margine anteriore partim ferrugineo; elytris 4 maculis flavo-ferrugineis, ut in figura positis, praeditis; antennis, palpis, pedibus et ore ferrugineis. Caput regulare, oculis convexis, sat amplis, temporibus nullis, sulcis frontilibus sat brevibus, dimidiam oculorum longitudine non attingentibus, modice divergentibus; antennis robustis, parum compressis, articulis 6-10° submoniliformibus, parum longioribus quam latioribus, articulis 4° et sequentibus pubescentibus. Pronotum transversum, sat convexum; long. 1.2 mm.; max. lat. 2.0 mm.; lat. ant. 1.2 mm.; lat. bas. 1.7 mm.; lateribus antice fortiter, postice medioeriter rotundatis; angulis anticis perparum prominentibus, obtusis, apice rotundato; posticis obtusis, distincte rotundatis; basi ad latera subtilissime marginata, utrinque unisulcata, punctis sat amplis sed raris et levissimis praedita, etiam in sulcis et in canaliculo laterali; sulcis basalibus brevibus, linearibus; canaliculo laterali antice sat angusto, postice fortissime dilatato, poris setigeris binis usitatis praedito; disco convexo, linea media fere indistincta. Elytra sat convexa, ovalia; humeris rotundatis, margine basali integro, stria scutellari nulla, striis sat profundis, finissime, fere indistincte crenulatis, interstitiis parum convexis, fere planis, tertio poro parvo post mediam longitudine praedito, 7° poro parvo apicali instructo, serie umbilicata fortissime rarefacta in medio. Subtus prosterno non sulcato, processu non distincte marginato, proepisternis levibus, metepisternis longis, postice fortiter constrictis, medioeriter punctatis, sternitibus primis ad latera leviter punctatis, caeteris levibus; sternite anali

maris puncto singulo, feminae punctis binis praedito. Pedes ut in caeteris speciebus generis *Celioschesia*.

Habitat: MOMBASA (*Miss E. M. Sharpe* 1895-8) (*teste* Staudinger) (holotype); N.W. RHODESIA: Kashitu et Nama-Ula (*H. C. Dollman*): 10 examples.

Holotypus ♂ et 3 paratypi in coll. Straneo; allotypus et 6 paratypi in British Museum.

I know of no species of this genus with which this new species can usefully be compared.

### *Cyrtotelus major* sp. n.

Long. 11.6 mm.; max. lat. 4.6 mm. Colore brunneo, obscurissimo, fere piceo in exemplis perfectae maturitatis, nitido, elytris iridescentibus; pedibus et antennis brunneo-ferrugineis, articulo primo antennarum et femoribus parum clarioribus. Caput regulare, leve, oculis sat parvis, modice convexis, postice inclusis in temporibus, non inflatis et valde et gradatim digradantibus; sulcis frontalibus brevibus, parum profundis, antennis sat subtilibus, parum compressis, articulis duobus apicalibus basim pronoti superantibus; articulis 4° et sequentibus pubescentibus. Pronotum subrectangulare, long. 3.0 mm.; max. lat. 4.0 mm.; lat. ant. 2.6 mm.; lat. bas. 3.8 mm.; lateribus modice rotundatis et sat constrictis antice; postice perparum constrictis, fere parallelis; angulis anticis distincte prominentibus, posticis rectis apice rotundato; margine antico distincte arcuatim excavato, canaliculo laterali angustissimo, lineari, poris setigeris binis usitatis instructo; basi non punctata, fere recta, tantum in medio leviter excavata, non marginata, utrinque sulco parvo, lineari, fere indistincto, marginem posticum non attingenti, praedita; disco parum convexo, linea media vix distincta. Elytra ovalia, sat convexa, praecipue apicem versus; long. 6.4 mm.; max. lat. 4.6 mm.; humeris fere rectis, dente distincto praeditis; margine basali integro, fere recto, vel perparum curvato; stria scutellari nulla; striis modice profundis, interstitiis perparum convexis, fere planis; interstitio tertio poris nullis praedito, septimo poris binis parvis praecipualibus instructo; apice elytrorum sat breviter rotundato. Subtus prosterno leviter longitudinaliter sulcato, processu plano, non marginato nec depresso; proepisternis leviter undulatis, non punctatis; metepisternis subquadratis, punctato-rugosis; sternitibus primis ad latera punctis sat crebris et rugis levibus obiectis; caeteris levibus, non punctatis; sternite anali maris anguste marginato, secundum apicem, poro singulo utrinque praedito, sat amoto a margine apicali. Pedibus regularibus, mediocriter elongatis; onychio subtus glabro. Aedeagus post bulbum basalem abrupte et recte flexus, dein rectus; apice rotundato, perparum torto, leviter dejecto. Microsculptura capitis isodiametrica, pronoti et elytrorum transversa, punctis impressis profundis et parvis commixta.

Habitat: S. AFRICA: Pondoland, Port St. John (*R. E. Turner*) 5 ♂♂.

Holotypus et paratypi in British Museum; paratypi in coll. Straneo.

This new species is very easily recognisable by the size. It is larger than any other known *Cyrtotelus*; the pronotum is rather strongly transverse.

### *Cyrtotelus elongatus* sp. n.

Long. 10.5 mm.; max. lat. 3.9 mm. Colore nigro piceo, leviter brunnescente, elytris iridescentibus; sterno et abdomine rufo-ferrugineis; antennis, palpis, pedibus et ore ferrugineis. Caput sat parvum, elongatum, oculis parvis, modice convexis, temporibus brevissimis, fere nullis, sulcis frontalibus brevissimis, mediocriter impressis, primum porum setigerum supraoculare non attingentibus; antennis sat subtilibus, modice compressis, vix basim pronoti attingentibus, articulis 4° et sequentibus pubescentibus. Pronotum rectangulare, long. 2.9 mm.; max. lat. 3.4 mm.; margine antico leviter excavato, lateribus antice modice rotundatis et mediocriter constrictis, postice fere rectis, perparum conver-

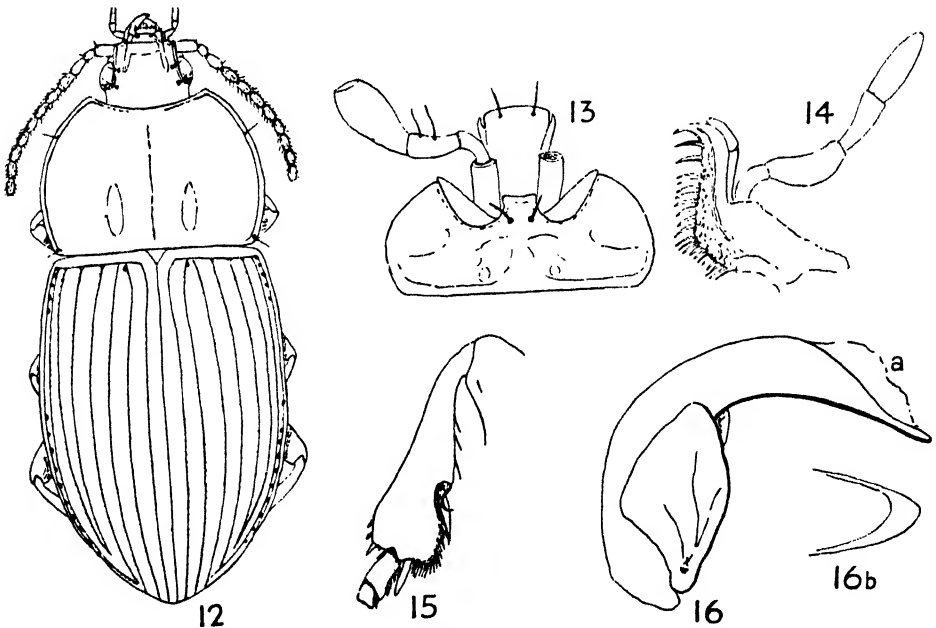
gentibus; angulis anticis parum prominentibus, apice leviter rotundato, posticis levissime obtusis, fere rectis, apice vix rotundato; canaliculo laterali angustissimo, poris setigeris binis usitatis praedito; basi non punctata, convexa, non marginata; utrinque unisulcata; sulcis basalibus  $\frac{2}{3}$  longitudinis pronoti attingentibus, parallelis, rectis, modice impressis, postice marginem pronoti non attingentibus; disco modice convexo, linea media fere indistincta. Elytra ovalia, convexa; long. 6.1 mm.; max. lat. 3.9 mm.; basi tam lata quam basi pronoti; lateribus post humeros gradatim et permodice dilatatis, maxima latitudine ad  $\frac{2}{3}$  vel  $\frac{1}{2}$  longitudinis; humeris quadratis, margine basali modice curvato humeros versus; striis profundis, levibus, interstitiis convexis, tertio poro nullo praedito; serie umbilicata leviter rarefacta in medio; apice elytrorum sat acute rotundato. Subtus prosterno leviter impresso, processu non marginato; proepisternis levibus, metepisternis parum longioribus quam latioribus, punctis levissimis praeditis; sternitibus primis sat crebre sed leviter punctatis, caeteris levibus; sternite anali levi, maris puncto singulo, feminae punctis binis praeditis. Pedes regulares, onychio glabro, articulo basali tarsorum posticorum extus sulcato.

Habitat: NATAL: Kloof, 1500 ft. (*R. E. Turner*) 1 ♂ et 1 ♀.

Holotypus ♂ in British Museum, allotypus in coll. Straneo.

Compared with the preceding species, it is smaller, more angustate; the interstices of the elytra are more convex than in any other species of this genus.

All the species of *Cyrtotelus* are very closely allied. A key will be found in my revision of the South African Pterostichini, to be published in the *Annals S. African Mus.*



FIGS. 12-16.—*Oodinkosa crassula* gen. et sp. n. 12, *Oodinkosa crassula*, type; 13, labium; 14, maxilla; 15, anterior tibia; 16, aedeagus, a, profile, b, apex.

#### *Oodinkosa* gen. n. (figs. 12-16).

Suboodiforme. Caput parvum, in pronoto sat inclusum, post oculos at constrictum, glabrum, clypeo bisetosus, setis binis supraorbitalibus; antennis brevibus, articulis 6-10°

submoniliformibus, 4° et sequentibus pubescentibus, articulo primo non scapiformi, tertio longitudine subaequali; labro antice fere recto, sex-setoso; mandibulis brevissimis et sat latis, apice subtili et brevissime curvato, scrobis seta nulla instructis; ligula lata, bisetosa, apice truncato, paraglossis membranaceis, sat subtilibus, liberis, ligula non longioribus; maxillis brevibus, ad apicem fortiter curvatis et acuminatis, intus basim versus sat crebre, apicem versus perparum ciliatis; palpis sat brevibus, glabris, articulo ultimo maxillarum ovato-fusiformi, labialium sat dilatato et ad apicem truncato, articulo paenultimo labialium bisetoso: mento brevi, lobis sat divergentibus, epilobis instar dentis lobos valde superantibus, dente medio sat prominente, apice lato et truncato, non bifido nec excavato. Pronotum transversum, lateribus bisetosis, margine laterali non subtili, canaliculo angusto. Elytra ad basim margine integro et forti praedita, 9-striata, stria scutellari nulla, stria secunda poro parvo basali instructa, interstitio tertio impunctato, serie umbilicata post humeros late interrupta. Subtus levis, praeter metepisterna; prosterno non depresso nec sulcato, processu late marginato, postice sat acute rotundato, sed non carinato; sternitibus non sulcatis, sternite anali apice sat late marginato, in ♂ et ♀ poro singulo utrinque praedito. Pedes sat breves, tibiis anticis sat fortiter compressis et latis apicem versus, ut in figura instructis; tarsis supra glabris, non pubescentibus, subtus setis regularibus, non crebris praeditis; onychio subtus glabro; tarsis anticis maris articulis tribus basalibus dilatatis et subtus squamulosis.

Genotypus: *Oodinkosa crassula* Stran.

The position of this very interesting new genus is not yet well defined. The peculiar characters place it undoubtedly in the Pterostichini-group; and it is certainly allied to the genus *Inkosa* Péring.; but in *Inkosa* the head is rather exceptional, the abdomen is very strongly sculptured, the ligula and the mentum are otherwise formed. I think the genus *Oodinkosa* must be provisionally placed in the proximity of *Cyrtotelus* Tschit., *Metaxys* Chaud., *Inkosa* Péring., etc.

#### *Oodinkosa crassula* sp. n. (fig. 12).

Long. 11.0 mm.; max. lat. 4.8 mm. Colore nigro nitido undique iridescente, leviter brunnescente in exemplis non perfectae maturitatis; antennis, palpis pedibusque rufoferrugineis. Caput parvum, oculis parvis, temporibus brevissimis, non inflatis, sulcis frontalibus subtilibus, sat impressis, non sinuatis, modice divergentibus; antennis sat subtilibus et brevibus, parum compressis, basim non attingentibus, articulis 4° et sequentibus pubescentibus. Pronotum transversum, long. 2.7 mm.; max. lat. 4.5 mm.; lateribus regularissime rotundatis, maxima latitudine basim versus posita; antice sat fortiter constrictis (lat. ant. 2.4 mm.); basim versus perparum constrictis (lat. bas. 4.1 mm.); angulis anticis modice prominentibus, rotundatis, posticis fere rectis, apice leviter rotundato; margine laterali modice spisso, canaliculo laterali angusto, lineari, punctis setigeris binis praedito; basi non punctata, fere recta, utrinque impressione levi, parum impressa notata; disco modice convexo, linea media brevi et subtili, parum dilatata basim versus. Elytra sat brevia et convexa, ovalia; long. 6.5 mm.; max. lat. 4.8 mm.; humeris quadratis, apice rotundato; margine basali integro, fere recto, humeros versus fere non curvato, striis profundis, fere indistincte crenulatis in fundo, interstitiis convexis. Subtus metepisternis brevibus, extus brevioribus quam antice latioribus, sat punctatis. Caeterum ut in descriptione generis.

Habitat: UGANDA: Mabira forest, Kagwe (C. C. Gowdey): 3 examples.

Holotypus ♂ et paratypus in British Museum; allotypus in coll. Straneo.

THE QUESTION OF THE WORK IN WHICH TEN GENERIC NAMES  
IN THE LEPIDOPTERA RHOPALOCERA HITHERTO ATTRI-  
BUTED TO FABRICIUS WERE FIRST PUBLISHED IN 1807; A  
CASE FOR DECISION BY THE INTERNATIONAL COMMISSION  
ON ZOOLOGICAL NOMENCLATURE

By Francis HEMMING, C.M.G., C.B.E., F.R.E.S.

I. INTRODUCTORY.

IN writing the present paper, I have had a two-fold object in view. My first object has been to draw attention to the fact that ten well-known generic names in the Lepidoptera Rhopalocera hitherto invariably regarded as having been published for the first time by Fabricius in 1807 in Illiger's *Magazin* were published also in the same year in the *Allgemeine-Literatur Zeitung* of Halle in a paper which, though anonymous, was certainly written by Illiger<sup>1</sup>; and to assess the evidence available on which to reach a decision as to which of the above papers was the first to be published. My second object has been to provide the material required to enable this case to be considered by the International Commission on Zoological Nomenclature. Incidentally the present paper gives preliminary and informal notice to the zoological profession that it is proposed to ask the International Commission finally to dispose of this case by the issue of an Opinion under "Suspension of the Rules."

2. My attention was drawn to the problem discussed in the present paper by my friend and correspondent, the late Dr. Foster H. Benjamin, who had an almost unrivalled knowledge of the early literature relating to the Lepidoptera, of which for many years he had made a special study. Dr. Benjamin first wrote to me on this subject with reference to my treatment of certain generic names in volume 1 of my *Generic Names of the holarctic Butterflies* which had been published by the British Museum (Natural History) in the latter part of 1934; and his object in so raising the question was to enable me to devise some suitable solution of the problem prior to the publication of the second volume of my book the preparation of which I had then temporarily laid aside in order to make a special study of the manuscripts of Jacob Hübner, which had recently come to light. I was still in correspondence with Dr. Benjamin on this subject at the time of his premature and much regretted death in January 1936. Six months later outbreak of the Civil War in Spain, and my duties as Secretary to the Non-Intervention Committee made it impossible for me to give any further thought to this matter till the present time.

<sup>1</sup> The following very interesting observations on this point are quoted from a letter dated 27th February 1935, which I received from Dr. Foster H. Benjamin, of the United States Department of Agriculture, Bureau of Entomology, Washington:—

"As regards the A.L.Z. paper . . . re authorship—obviously Illiger—by obtaining other issues of the A.L.Z. seeing that the style of all entomological reviews therein before 1809 is identical with that of Illiger's Magazine, comparing papers and seeing that those discussed in detail in the latter are casually discussed in the former, and vice versa, it becomes evident that the A.L.Z. (prior to 1809) and Illiger's Magazine supplemented and complemented one another, no one but Illiger could have written on so many different groups in such a manner if we exclude Fabricius and Panzer (the former excluded by the wording of the 1807 paper on Hübner, the latter by his own introduction which comments on Illiger and the A.L.Z.)."



## II. STATEMENT OF THE CASE.

3. In volume 6 of the *Magazin für Insektenkunde* (Illiger), the title page of which is dated 1807, there appeared an article (pp. 277, 278) entitled "Die neueste Gattungs-Eintheilung der Schmetterlinge aus den Linnéischen Gattungen *Papilio* und *Sphinx*," to which was attached a synopsis (pp. 279-289) of the characters of 49 genera entitled "Schmetterlings-Gattungen. A. Nach Fabricii Systema Glossatorum Tom. I." The article itself was anonymous, but there is practically no doubt that it was written by Illiger. The synopsis of genera was, as the title shows, taken from Fabricius' unpublished *Systema Glossatorum*, and it is therefore perfectly correct to attribute to Fabricius the new generic names included therein and not to Illiger or whoever was the anonymous author of the article beginning on p. 277. M. Felix Bryk has recently (1938) edited a facsimile (published by the Verlag Gustav Feller, Neubrandenburg) of one of the two surviving proof copies of Fabricius' unpublished *Systema Glossatorum*, in which all the 49 genera mentioned in the synopsis given in Illiger's *Magazin* are given in a preliminary Key ("Characteres Generum") which includes also a fiftieth name for a genus of butterflies (*Casinia* Fabricius) which did not appear in the synopsis in the *Magazin*.

4. In the issue dated 19th December 1807 of the *Allgemeine-Literatur Zeitung*, which, though normally treated as being of Jena, was in fact at this time published at Halle, there is an anonymous article, which I accept as having been written by Illiger, which contains a detailed review of the first 34 plates of the *Sammlung exotischer Schmetterlinge* published by Jacob Hübner. A facsimile of this article is given on pp. 43-45 of volume 2 of my *Hübner* published by the Royal Entomological Society of London in 1937. In this article each of the species figured on the 34 plates in question is considered critically, and, as explained in a preliminary note, the generic name according to the system of Fabricius is added. In the following table, I give the names of the species figured by Hübner, the number of the plate on which each species is so figured, the genus assigned to each species by Hübner, and the genus of the Fabrician system allotted to each species by Illiger in the review referred to above:—

Generic names applied to the species figured on the first 34 plates published of Hübner's *Samml. exot. Schmett.* by Illiger in his anonymous review of the species so figured which appeared in the issue of 19th December 1807 of the *Allgem. Lit. Ztg. Halle [Jena]*.

Name of species.	Pl. no.	Generic name used by Hübner.	Generic name used in <i>Allgem. Lit. Ztg. Halle [Jena]</i> .
<i>aetolus</i>	[102]	<i>Rusticus</i>	<i>Hesperia</i>
<i>gnidus</i>	[104]	<i>Rusticus</i>	<i>Helicopsis</i>
<i>demoleas</i>	[116]	<i>Princeps</i>	<i>Papilio</i>
<i>hellica</i>	[141]	<i>Mancipium</i>	<i>Pontia</i>
<i>fabius</i>	[148]	<i>Consul</i>	<i>Brassolis</i> ?
<i>licus</i>	[150]	<i>Urbanus</i>	<i>Castnia</i>
<i>thraso</i>	[151]	<i>Urbanus</i>	<i>Thymeles</i>
<i>proteus</i>	[155]	<i>Urbanus</i>	<i>Thymeles</i>
<i>niveus</i>	[159]	<i>Urbanus</i>	<i>Thymeles</i>
<i>cymo</i>	[2]	<i>Nereis</i>	<i>Hymenitis</i>
<i>doto</i>	[1]	<i>Nereis</i>	<i>Hymenitis</i>
<i>neso</i>	[5]	<i>Nereis</i>	<i>Hymenitis</i>
<i>ninonia</i>	[6]	<i>Nereis</i>	<i>Hymenitis</i>
<i>polymnia</i>	[7]	<i>Nereis</i>	<i>Hymenitis</i>
<i>dianasa</i>	[8]	<i>Nereis</i>	<i>Mechanitis</i>
<i>eunice</i>	[9]	<i>Nereis</i>	<i>Neptis</i>



6. It is necessary therefore at this stage to consider what evidence, whether direct or indirect, is available to determine whether or not the article in volume 6 of Illiger's *Magazin* appeared before that in the *Allgemeine-Literatur Zeitung*; and therefore whether Fabricius is the author of the 12 names given in column (a) above (as he would be in the former event) or whether Illiger through his review of Hübner's plates is the author of the 12 names in question (as would be the case in the latter event). This is not a matter of theoretical interest only, but is one of great practical importance, since in almost every case the included species in the two papers are different, with the result that, if it proved to be the case that Illiger's review of Hübner's plates was published before the extract from Fabricius' *Systema* given in Illiger's *Magazin*, the type of almost every one of the genera in question would need to be changed. The evidence available on the point at issue is given in the following paragraphs.

7. Illiger's review of Hübner's plates which appeared in the *Allgemeine-Literatur Zeitung* is known to have been published in 1807 on 19th December, since it was included in Number 303 of that journal which bears that date. As regards the article in Illiger's *Magazin*, the volume in question (vol. 6) is dated 1807, and in the absence of definite evidence to the contrary must be accepted as having been published in that year. There is no direct evidence as to what month in that year the portion concerned (pp. 277-289) was published.

8. In paragraph 3 above, I have shown that the title of the article in Illiger's *Magazin* expressly states (p. 277) that the genera (49 in number) given in the synopsis (pp. 279-289) represent the latest revision of the Linnaean genera *Papilio* and *Sphinx*, and that the title to the synopsis shows that this revision was the work of Fabricius. Further, in the same paragraph, I have shown that at the time in 1807 that Fabricius wrote the manuscript of his *Systema Glossatorum* he had slightly modified the ideas set out in the article in Illiger's *Magazin* and had increased the number of genera from 49 to 50. There can therefore be no doubt that the article in Illiger's *Magazin* was not only written but also passed for final printing on some date in 1807 prior to the date in the same year on which Fabricius wrote the manuscript of his *Systema Glossatorum*.

9. Illiger's unsigned article published on the 19th December 1807 issue of the *Allgemeine-Literatur Zeitung* was concerned only with the first 34 plates of Hübner's *Sammlung exotischer Schmetterlinge* and the genera of Fabricius are mentioned only incidentally in relation to the species figured by Hübner on the plates under review. Nevertheless of the 17 Fabrician genera among which (as shown in paragraph 4 above) the species figured on these 34 plates were distributed, there were no less than 3 genera which appeared neither in the article in volume 6 of Illiger's *Magazin* nor in the proof of Fabricius' *Systema Glossatorum*, both of which expressly claimed as at the dates concerned to set out the latest revision by Fabricius of the genera *Papilio* Linnaeus and *Sphinx* Linnaeus. There can therefore be no doubt whatever that Illiger's review of Hübner's plates published on 19th December 1807 in the *Allgemeine-Literatur Zeitung* was written, and therefore printed, subsequent to the date on which the paper in volume 6 of Illiger's *Magazin* was printed and passed for publication, and subsequent also to the date still later in 1807 on which Fabricius sent the manuscript of his *Systema Glossatorum* to the printer.

10. There thus remains one question only for consideration, namely the possibility that the Illiger *Magazin* article, though admittedly written before Illiger's review of the Hübner plates, was nevertheless actually published after the appearance of that review. Both are dated 1807 and the latter is dated 19th December of that year. In order therefore to sustain an argument

that these articles were published in 1807 in the reverse order to that in which they were written, it would be necessary to assume (i) that for some unknown reason the publication of the Illiger *Magazin* was delayed until after 19th December 1807 and therefore took place during the twelve-day period from 20th December 1807 to 31st December 1807; and (ii) that, although by 19th December Fabricius had subdivided the Linnean genera *Papilio* and *Sphinx* into 53 genera (50 given in the proof of the *Systema Glossatorum* which was sent to the printer in 1807 prior to the date on which Illiger wrote his review of Hübner's plates, plus three genera the names of which appeared for the first time in the said review), both Fabricius, as author, and Illiger, as editor of the *Magazin*, allowed the publication of a paper which expressly claimed to give the latest particulars relating to Fabricius' system but which was in fact already out of date and contained only 49 out of the 53 genera which, on the hypothesis here under consideration, he had already adopted.

11. I must, however, add that in correspondence with me the late Dr. Benjamin put forward the view that vol. 6 of Illiger's *Magazin* was published after the close of 1807 (although it bears the date of that year), and therefore that Illiger's review in the *Allgemeine-Literatur Zeitung* was published well before the synopsis of Fabricius' genera given in vol. 6 of Illiger's *Magazin*. Dr. Benjamin based this view upon the following considerations. In the first place, he considered that the fact that volumes 3 and 4 of Illiger's *Magazin* were not reviewed in the *Allgemeine-Literatur Zeitung* until the early part of 1807, and that vol. 5 was reviewed in the same journal later in that year indicated that for some reason the publication of the successive volumes of Illiger's *Magazin* was retarded and did not necessarily take place in the years given on the title pages of the volumes concerned. Dr. Benjamin then drew attention to the fact that in the case of one set of Illiger's *Magazin* preserved in the United States which appeared to be in contemporary binding, volumes 3 and 4 were bound in a single volume. From this he deduced that some cause—perhaps lack of funds—led to a delay in the distribution of vol. 3 with the result that that volume was not distributed until 4 was ready for distribution also. Dr. Benjamin then referred to the Reichard fire in which admittedly a large part of the stock of vol. 6 of Illiger's *Magazin* was destroyed. He stated that he was aware of three copies in the United States, which he accepted as originals, but he took the view that this volume was not distributed (*i.e.* was not published) in 1807 or indeed at any date sufficiently early to permit of it being reviewed by Illiger in the *Allgemeine-Literatur Zeitung*. In other words, according to this argument, this volume was not distributed at least until the end of 1808. For it seemed obvious to Dr. Benjamin that, having regard to the fact that the *Allgemeine-Literatur Zeitung* was issued at intervals of three days only and that Illiger would be the first person in the world to have at his disposal for review purposes a copy of vol. 6 of his own *Magazin*, he would certainly have reviewed that volume if it had been published during the period in which he was writing reviews for the *Allgemeine-Literatur Zeitung*. Finally, Dr. Benjamin drew attention to the fact that the main text of vol. 4 of Latreille's *Gen. Crust. Ins.*, published in 1809, contained no reference to vol. 6 of Illiger's *Magazin*, while the addenda to the above volume of Latreille's work was full of such references. From this, Dr. Benjamin concluded that Latreille did not receive vol. 6 of Illiger's *Magazin* until about 1809 in time to enable him to include any references thereto in the main portion of vol. 4 of his own work.

12. It is now necessary to examine the various arguments summarised in the preceding paragraph. Dr. Benjamin, it should first be noted, attached

great importance to the slow and spasmodic way in which Illiger reviewed his own *Magazin* in the *Allgemeine-Literatur Zeitung*, and to the fact that vol. 6 of the *Magazin* was never reviewed in it at all. Neither of these points seems to me to have any significance. The *Allgemeine-Literatur Zeitung* was primarily concerned with the reviewing of separate works and not with that of journals; and, insofar as journals were reviewed, it would not cause me any surprise to find that the reviewer (in this case Illiger) exhibited a certain modesty in reviewing a journal (in this case Illiger's *Magazin*) of which he was himself the editor, except perhaps when he was short of other material and needed matter to fill up a space. The point made by Dr. Benjamin that in one set of Illiger's *Magazin* preserved in the United States volumes 3 and 4 are bound in a single volume in what appears to be a contemporary binding, cannot be accepted as meaning more than that the original owner of that copy found it convenient to bind up these two volumes in this way, since there are numerous copies in Europe which equally appear to be in contemporary binding though volumes 3 and 4 are separately bound. In any case, the way in which the volumes of this work were bound depended on the choice of the purchaser and not upon Illiger, since there was certainly in this case no such thing as a publisher's binding. As regards the Reichard fire, there is no doubt that part of the stock of vol. 6 of Illiger's *Magazin* was destroyed in this way, but, judging from the number of complete sets of Illiger's *Magazin* extant in Europe, a very considerable number of copies had either been sold before the fire took place or escaped destruction on that occasion. The evidence afforded by vol. 4 of Latreille's *Gen. Crust. Ins.* certainly shows almost beyond doubt that Latreille did not obtain a copy of vol. 6 of Illiger's *Magazin* until some time in 1809; but it throws no light whatever upon the only question of importance, namely the date on which that volume of Illiger's *Magazin* was published. Indeed, when it is remembered that the Napoleonic wars were in full swing during the period in question, it is perhaps surprising to find that a French naturalist was able as early as 1809 to secure a copy of a German publication within two years of its publication. As regards the suggestion that perhaps Illiger found himself in financial difficulties—a suggestion supported by no concrete evidence whatever—it must be observed that vol. 6 of Illiger's *Magazin* is dated 1807 on the title page and therefore that the type at least must have been set up in that year. This being so, the main cost, that of printing, had already been incurred in 1807, and, if Illiger had been in financial difficulties, he would certainly not have delayed the actual publication of the volume on that account. On the contrary, his first consideration would have been to secure that publication took place at the earliest possible moment in order that through sales he might recoup himself to some extent at least in respect of the expenditure already incurred on printing.

13. From the evidence given in the preceding paragraph, it will be seen that the arguments brought forward by Dr. Benjamin entirely fail to establish the proposition that Illiger's review of Hübner's plates was published before the synopsis of Fabricius' genera in vol. 6 of Illiger's *Magazin*. I have myself no doubt that the reason for this is the simplest one in the world, namely that Illiger—who was certainly a very careful worker—took good care not to refer in print to Fabricius' new genera until he had first published (in vol. 6 of his own *Magazin*) the summary of the characters of those genera taken from Fabricius' manuscript *Systema Glossatorum*. Further, there is, in my opinion, no reason to doubt that vol. 6 of Illiger's *Magazin* was published in 1807, the year given on the title page, on some date prior to 19th December of that year.

## III. THE NEED FOR SECURING A DEFINITE DECISION.

14. While, as explained above, I have no doubt myself as to the correct interpretation of the evidence available, I realise that it is always possible for opinions to differ in a matter of this kind. It is necessary to examine first the issues at stake, and in the light of that examination to consider how best to secure a decision by which to stabilise the nomenclature of the ten genera concerned, and consequently of the very large number of species involved.

15. The first step required is to compare the position as it exists to-day on the basis of the recognition of Illiger's *Magazin* as the place of first publication of the ten genera in question with the position which would arise if the 19th December 1807 issue of the *Allgemeine-Literatur Zeitung* were recognised as the place of first publication of these names. This comparison gives the following results :—

## DANAIDAE.

*Mechanitis* Fabricius.

Fabricius, 1807, *Mag. f. Insektenk.* (Illiger) 6 : 284.

As I have shown (Hemming, 1934, *Gen. Names hol. Butt.* 1 : 27), the type of this genus is *Papilio polymnia* Linnaeus, 1758.

If there were such a genus as *Mechanitis* Illiger, 1807 (*Allgem. Lit. Ztg, Halle, [Jena]* 1807, 2 : 1180, 1181), there would be seven species from which the selection of the type might be made, namely : *Nereis dianasas* Hübner, [1806]; *Nereis vesta* Hübner, [1807]; *Nereis thelxiope* Hübner, [1806]; *Nereis thamar* Hübner, [1806]; *Papilio dido* Linnaeus, 1764; *Papilio julia* Fabricius, 1775; and *Papilio vanillae* Linnaeus, 1758. Every one of the above species is referable to the NYMPHALIDAE, and the selection of any of them as the type of *Mechanitis* Illiger (if there were such a genus) would involve great confusion through the transfer of this well-known genus from the Family DANAIDAE to the Family NYMPHALIDAE.

*Euploea* Fabricius.

Fabricius, 1807, *Mag. f. Insektenk.* (Illiger) 6 : 280.

I have shown (Hemming, 1934, *Gen. Names hol. Butt.* 1 : 23-25) that the type of this genus under a strict interpretation of the Rules is *Papilio similis* Linnaeus, 1758, a species referable to the genus *Danaus* Kluk, 1802. It was for this reason that on that occasion I presented a case for consideration by the International Commission on Zoological Nomenclature that, acting in virtue of the Plenary Powers conferred upon them by the International Zoological Congress, they should suspend the Rules in this case and fix the type of this genus as *Papilio corus* Fabricius, 1793, thereby preserving this well-known generic name for use in the universally accepted sense. This proposal was endorsed by the International Committee on Entomological Nomenclature at its meeting at Madrid in 1935 and was accepted by the International Commission on Zoological Nomenclature at their meeting held in Lisbon in the same year.

If there were such a genus as *Euploea* Illiger, 1807 (*Allgem. Lit. Ztg, Halle, [Jena]* 1807, 2 : 1180, 1181), there would be three species from which the selection of the type might be made, namely : *Lemnas* [sic] *cora* Hübner,

[1807] (= *Papilio core* Cramer, 1780, a species wholly distinct from, but occasionally confused with *Papilio corus* Fabricius, 1793); *Lemnas* [sic] *nemertes* Hübner, [1807]; and *Papilio genutia* Cramer, 1779. Of these species, the first two are referable to *Euploea* Fabricius as commonly understood, and the selection of either of these species as the type would therefore cause no disturbance of existing practice.

#### BRASSOLIDAE.

##### *Brassolis* Fabricius.

Fabricius, 1807, *Mag. f. Insektenk.* (Illiger) 6 : 282.

The type of this genus, which is of special importance through providing the Family name BRASSOLIDAE, is *Papilio sophorae* Linnaeus, 1758, having been selected as such by Westwood in 1851 (*in* Doubleday, *Gen. diurn. Lep.* (2) : 341).

If there were such a genus as *Brassolis* Illiger, 1807 (*Allgem. Lit. Ztg, Halle, [Jena]* 1807, 2 : 1181), there would be three species from which the selection of the type might be made, namely : *Hamadryas astina* Hübner, [1807]; *Najas themis* Hübner, [1807]; and *Potamis leonte* Hübner, [1807]. A fourth species, *Consul fabius* Hübner, [1807] was assigned to this genus by Illiger with a note of interrogation, but this species, being a *species inquirenda* from the standpoint of Illiger, is not eligible under the Code for selection as the type. Of the three species which are so eligible the two first belong to the NYMPHALIDAE, while the third is a synonym of the type of *Morpho* Fabricius, 1807, the genus which gives its name to the MORPHIDAE. The selection of any of these three species as the type of this genus would inevitably create the utmost confusion.

#### NYMPHALIDAE.

##### *Neptis* Fabricius.

Fabricius, 1807, *Mag. f. Insektenk.* (Illiger) 6 : 282.

The type of the very widely distributed and extremely well-known palaearctic and aethiopian genus *Neptis* Fabricius is, as I have shown (Hemming, 1934, *Gen. Names hol. Butt.* 1 : 86), *Papilio aceris* Esper, 1783.

If there were such a genus as *Neptis* Illiger, 1807 (*Allgem. Lit. Ztg, Halle, [Jena]* 1807, 2 : 1180), it would be a monotypical genus with *Nereis eunice* Hübner, [1807] as type. This species is referable to the equally well-known American genus *Phyciodes* Hübner, [1819]. It is difficult to imagine greater confusion than that which would arise if the species now known as *Phyciodes* were transferred en bloc to the genus *Neptis*, as would be necessary in the circumstances discussed above.

##### *Apatura* Fabricius.

Fabricius, 1807, *Mag. f. Insektenk.* (Illiger) 6 : 280.

The type of this very well-known genus of European and Asiatic "Purple-Emperors" is, as I have shown (Hemming, 1934, *Gen. Names hol. Butt.* 1 : 76), *Papilio iris* Linnaeus, 1758.

If there were such a genus as *Apatura* Illiger, 1807 (*Allgem. Lit. Ztg, Halle, [Jena]* 1807, 2 : 1181), it would be a monotypical genus with *Papilio amphinome*

Linnaeus, 1767, as the type. That species is the type, as I have shown (Hemming, 1934, *ibid.* 1 : 82-83) of *Hamadryas* Hübner, [1806], of which *Ageronia* Hübner, [1819], is a synonym. The existence of the genus *Apatura* Illiger, if such could be established, would therefore create very great confusion through involving the transfer of the name *Apatura* from an extremely well-known genus of butterflies confined to the Old World to an equally well-known group of butterflies confined to the New.

#### RIODINIDAE.

##### *Helicopis* Fabricius.

Fabricius, 1807, *Mag. f. Insektenk.* (Illiger) 6 : 285.

The type of this well-known genus is, as I have shown (Hemming, *Gen. Names hol. Butt.* 1 : 98), *Papilio cupido* Linnaeus, 1758.

If there were such a genus as *Helicopis* Illiger, 1807 (*Allgem. Lit. Ztg, Halle, [Jena]* 1807, 2 : 1180), it would be a monotypical genus with *Papilio gnidus* Fabricius, 1787, as the type. This would involve no change since *gnidus* Fabricius is congeneric with *cupido* Linnaeus, the type of *Helicopis* Fabricius.

##### *Nymphidium* Fabricius.

Fabricius, 1807, *Mag. f. Insektenk.* (Illiger) 6 : 286.

The type of *Nymphidium* Fabricius is, as I have shown (Hemming, 1934, *Gen. Names hol. Butt.* 1 : 102) *Papilio caricae* Linnaeus, 1758.

If there were such a genus as *Nymphidium* Illiger, 1807 (*Allgem. Lit. Ztg, Halle, [Jena]* 1807, 2 : 1180), it would be a monotypical genus with *Limnas leucosia* Hübner, [1806] as type. This species is congeneric with *caricae* Linnaeus, and there would, therefore, be no change in existing practice, since *Nymphidium* Illiger would replace *Nymphidium* Fabricius.

##### *Emesis* Fabricius.

Fabricius, 1807, *Mag. f. Insektenk.* (Illiger) 6 : 287.

The type of *Emesis* Fabricius is, as I have shown (Hemming, 1934, *Gen. Names hol. Butt.* 1 : 99) *Hesperia ovidius* Fabricius, 1793.

If there were such a genus as *Emesis* Illiger, 1807 (*Allgem. Lit. Ztg, Halle, [Jena]* 1807, 2 : 1180), it would be a monotypical genus with *Limnas pharea* Hübner, [1807] as the type. This species is the type of the genus *Mesene* Doubleday, 1847, and the transfer of the very well-known name *Emesis* to the species now assigned to *Mesene* Doubleday would inevitably cause greater confusion than uniformity.

#### PIERIDAE.

##### *Pontia* Fabricius.

Fabricius, 1807, *Mag. f. Insektenk.* (Illiger) 6 : 283.

The type of this genus is, as I have shown (Hemming, 1934, *Gen. Names hol. Butt.* 1 : 130) *Papilio daphidice* Linnaeus, 1758.

If there were such a genus as *Pontia* Illiger, 1807 (*Allgem. Lit. Ztg, Halle, [Jena]* 1807, 2 : 1180), it would be a monotypical genus with *Papilio hellica* Linnaeus, 1767, as the type. There would be no disturbance in existing practice, since *hellica* Linnaeus is congeneric with *daphidice* Linnaeus, and consequently *Pontia* Fabricius would fall as a synonym of *Pontia* Illiger.



## HESPERIIDAE.

*Thymeles* Fabricius.

Fabricius, 1807, *Mag. f. Insektenk.* (Illiger) 6 : 287.

The type of this genus is, as I have shown (Hemming, 1934, *Gen. Names hol. Butt.* 1 : 163) *Papilio tages* Linnaeus, 1758, the genus *Thymeles* Fabricius being therefore a synonym of *Erynnis* Schrank, 1801, of which the same species is the type.

If there were such a genus as *Thymeles* Illiger, 1807 (*Allgem. Lit. Ztg.*, Halle, [Jena] 1807, 2 : 1180), there would be three species from which the selection of the type could be made, namely : *Urbanus thraso* Hübner, [1807] (the type of *Eantis* Boisduval, 1836, a synonym of *Achlyodes* Hübner, [1819]); *Papilio proteus* Linnaeus, 1758 (the type of *Urbanus* Hübner, [1806]); and *Papilio niveus* Cramer, 1775 (the type of *Heliopterus* Billberg, 1820). In view of the history of the name *Thymeles* Fabricius, it would be highly objectionable if the name *Thymeles* (attributed to Illiger) were resurrected to supersede either *Achlyodes* Hübner or *Heliopterus* Billberg, and very considerable confusion would be created thereby. This difficulty could, however, be overcome by the selection of *Papilio proteus* Linnaeus as the type, since in that event *Thymeles* Illiger would be nothing but a synonym of *Urbanus* Hübner, [1806].

16. The detailed information given in the preceding paragraph regarding the position which would arise if it could be established that the ten Fabrician names were published by Illiger in 1807 before their diagnoses by Fabricius were published in that year in Illiger's *Magazin* may be summarised as follows :—

(a) Maximum possible confusion caused by the transfer of well-known generic names from one Family to another.

(1) *Mechanitis* which would be transferred from the DANAIIDAE to the NYMPHALIDAE;

(2) *Brassolis* (now the type genus of the BRASSOLIDAE) would be transferred either to the NYMPHALIDAE or to the MORPHIDAE, according to which of the available species were selected as the type;

(b) Very great confusion caused by the transfer within a given Family of a well-known generic name from one well-known genus to another;

(3) *Neptis* would be transferred from the extremely well-known European, Asiatic, and African genus universally so known to the equally well-known American genus invariably known as *Phyciodes* Hübner;

(4) *Apatura* would be transferred from the extremely well-known European and Asiatic genus universally so known to the very well-known American genus of which the correct generic name is *Hamadryas* Hübner, but which has hitherto usually been known by the later name *Ageronia* Hübner;

(5) *Emesis*, a very well-known genus in the RIODINIDAE, would be transferred from the group of about 40 species universally known by that name and would in future be the name for the genus now known by the name *Mesene* Doubleday;

(c) Considerable confusion caused unless particular care be taken in the selection of the type of the genus.

(6) *Thymeles* would be resurrected from being a dead synonym and would replace either *Achlyodes* Hübner or *Heliopterus* Billberg, unless whoever fixed the type of the genus took care to select for this purpose the third available species, namely, *Papilio proteus* Linnaeus, thereby making *Thymeles* a synonym of *Urbanus* Hübner.

(d) Cases where no confusion would arise.

(7) *Euploea*; *Helicopsis*; *Nymphidium*; and *Pontia*.

#### IV. ACTION RECOMMENDED.

17. It has several times happened in different branches of zoology that the discovery of some long-forgotten work or some similar cause has led to grave disturbance in the nomenclature of the group concerned; that the necessary changes have however been introduced, and after a period of years have won for themselves a widespread though grudging acceptance; and that it was not until this stage had been reached that an effort was made to secure the approval of the International Commission on Zoological Nomenclature to the suppression of the work which was responsible for the original change in the names in question. Not unnaturally, belated efforts of this kind are apt to encounter opposition from workers, who would have been glad to see the suppression of the work in question if this could have been secured shortly after its original discovery but who are of opinion that, by reason of the delay which has occurred, the names have become so deeply embedded in the recent literature of the subject that a decision at this stage to return to the older practice would cause greater confusion than uniformity. Fortunately no such argument can be advanced in the case dealt with in the present paper, since no claim has ever been advanced that the Fabrician names in vol. 6 of Illiger's *Magazin* were anticipated by the names published by Illiger in the *Allgemeine-Literatur Zeitung*.

18. There is, I am confident, no worker in the Lepidoptera who would wish to see the complete change in the application of five of the best-known names of butterfly genera which (as I have shown in paragraph 15 above) would follow automatically, if it could be established that the names in question were first published by Illiger in the *Allgemeine-Literatur Zeitung*. It is, however, clearly of the first importance that in a case of this kind there should be no loop-hole for doubt whatever. This can only be secured by obtaining from the International Commission on Zoological Nomenclature an Opinion disposing of the matter once and for all. This might be effected in either of two ways, the first being for the Commission to suppress altogether the paper by Illiger in the *Allgemeine-Literatur Zeitung* under "Suspension of the Rules," the second being for the Commission to declare also under "Suspension of the Rules" that the paper in vol. 6 of Illiger's *Magazin* is to be taken as the first place of publication of the ten generic names which appeared also in the paper published in the *Allgemeine-Literatur Zeitung*. The first of these courses is open to the objection that it would go further than is either necessary or equitable, since it would involve the suppression also of the three generic names (*Hymenitis* [Illiger], *Eurybia* [Illiger], and *Lemonias* [Illiger]) which were undoubtedly first published by Illiger on the occasion in question. The second course is to be preferred, since it does neither more nor less than the circumstances of the case require; and this therefore is the course which I propose to recommend the International Commission to adopt.

CORRECTION OF TYPE LOCALITY FOR TWO SPECIES OF  
MUTILLIDAE DESCRIBED BY FREDERICK SMITH  
(HYMENOPTERA)<sup>1</sup>

By Clarence E. MICKEL, Ph.D., F.R.E.S.  
(University of Minnesota.)

*Timulla (Trogaspidia) auroguttata* (Smith). (New combination.)

1855. *Mutilla auroguttata* Smith, *Cat. Hymen. Brit. Mus.* 3 : 52, female.  
1897. *Mutilla auroguttata* Dalle Torre, *Cat. Hymen.* 8 : 14, female.  
1903. — *auroguttata* André, *Gen. Ins.* 11 : 72, female.  
1913. *Mutilla repraesentans* Zavattari, *Arch. Naturg.* 79 (A) (3) : 29, female (*nec* Smith).  
1933. *Timulla (Trogaspidia) repraesentoides* Mickel, *Ann. ent. Soc. Amer.* 26 : 411–413, female.  
**Syn. n.**  
1933. *Timulla (Trogaspidia) repraesentoides* Mickel, *Lingnan Sci. J.* 12 : 309–310, female.  
1935. *Timulla (Trogaspidia) repraesentoides* Mickel, *Trans. R. ent. Soc. Lond.* 83 : 254, female.

Corrected data for type specimen : Female, CHINA : Hongkong (*Harrington*), in British Museum (Natural History).

The type locality for *auroguttata* is cited as "Brazil" in the original description and the type specimen in the British Museum (Natural History) is so labelled. The type specimen was examined by me in 1930 and a manuscript redescription was made. The species is obviously a member of the genus *Timulla* Ashmead. At the time the type was examined a detailed and intensive study of the genus *Timulla* of the New World and of the Islands of the Pacific Ocean had not yet been made. Later, in 1937, after studying the genus *Timulla* in both regions it was suspected from the description that *auroguttata* must be an oriental species of the subgenus *Trogaspidia* since (as has been pointed out, Mickel 1933a) the pale pubescent pattern of the second abdominal segment of the females consists of a pair of more or less circular spots in the subgenus *Trogaspidia* (Ethiopian and Oriental), and of linear spots in the subgenus *Timulla* (Nearctic and Neotropical). The type specimen of *auroguttata* has a pair of circular, pale pubescent spots on the second abdominal tergite. The suspicion was further strengthened by the fact that no specimens could be found in the abundant material of this genus from Brazil, which was available to me for study. I then wrote to Mr. Robert B. Benson, of the British Museum (Natural History), requesting that he examine the records of the Museum to determine if possible where the original lot of material that included the type specimen of *auroguttata* Smith came from. He replied, "I have examined the type of *Mutilla auroguttata* Smith and find that the registered number 53/61 refers to the general collection purchased from Stephens in 1853 from Hongkong, Brazil, etc., collected by Mr. Harrington. This being so, it is impossible to say where the specimen came from, because though labelled Brazil it may easily have been labelled wrongly, coming in a mixed collection like this."

After learning that a part of the material, which included the type of *auroguttata* came from Hongkong, I compared the redescription of the type made in 1930 with the key to the females of *Timulla (Trogaspidia)* in "The Mutillidae of Asia" (Mickel, 1933b) and found that the characters given in the description would run *auroguttata* in the key to *repraesentoides* Mickel. There are a number of examples of the latter species collected at Canton, China, determined by myself after comparison with paratypes from Formosa, and now

<sup>1</sup> Paper No. 1716 Scientific Journal Series, Minnesota Agricultural Experiment Station.  
PROC. R. ENT. SOC. LOND. (B) 8. PT. 9. (SEPTEMBER 1939.)

in the University of Minnesota collection. These were compared in detail with the redescription and the conclusion reached that at least the Chinese specimens of *repraesentoides* Mickel were the same as *auroguttata* Smith. Later, three of the Canton, China, specimens determined by me as *repraesentoides*, and a paratype of *repraesentoides* from Formosa were sent to Mr. H. T. Pagden, who happened to be in England. He was kind enough to compare these specimens with Smith's type of *auroguttata*. He wrote that the specimens sent agree with the type, except in minor differences of size and punctuation, which he outlined to me in detail.

My conclusion is that the Canton, China, specimens are undoubtedly the same as the type of *auroguttata* Smith, that the type specimen came from Hongkong, China, and was incorrectly labelled "Brazil." The type locality of *auroguttata* Smith should be corrected to read "Hongkong, China." I have stated before (Mickel, 1933b) that I am unable to find any fundamental differences between the Canton, China, specimens determined by me as *repraesentoides* and the type material of that species from Formosa. If it can be shown later that the Canton specimens are specifically or subspecifically distinct, then the name *repraesentoides* may be taken from synonymy and used for the Formosa material and the name *auroguttata* will be reserved for the Chinese material.

I am greatly indebted to Mr. Robert B. Benson and Mr. H. T. Pagden for their valuable assistance to me in unravelling this puzzle.

*Ephuta notabilis* (Smith). (New combination.)

1879. *Mutilla notabilis* Smith, *Descr. N. Sp. Hymen.* : 204, female.

1897. *Mutilla notabilis* Dalle Torre, *Cat. Hymen.* 8 : 67, female.

1903. *Ephutomorpha notabilis* André, *Gen. Ins.* 11 : 50, female.

Corrected data for type specimen : Female, SOUTH AMERICA, in British Museum (Natural History).

The original description of this species cites the locality as "Tasmania" and the type specimen is so labelled. When I examined the type in 1931 it was apparent immediately that the specimen was a representative of the genus *Ephuta* Say (= *Rhopotromutilla* André), which is known only from the New World. The type specimen also bears a label with the numbers "63/43" written on it. These numbers refer to the accession register of the British Museum (Natural History). On consulting the register it was found that "63/43" referred to a lot of specimens acquired in 1863 among which the only Hymenoptera were 49 specimens from South America. There can be no question that the type specimen has been mislabelled "Tasmania," and that the error was carried over into the original description.

It is impossible at the present time to be more specific regarding the geographical distribution of the species than simply "South America."

Following is a redescription of the type specimen :—

Female. Head and pronotum black, the mandibles, antennae, remainder of thorax, abdomen and legs, ferruginous; clypeus elevated posteriorly, the elevated margin serrate; first segment of flagellum equal in length to the second; first abdominal segment, seen from above, distinctly broader than long; front and vertex clothed with appressed, golden pubescence, sparse on the front, dense on the vertex; posterior margin of second tergite and tergites three to five each with a pair of large, transverse spots of dense, appressed, golden pubescence, the spots of each pair separated by black pubescence, the whole forming a pair of longitudinal, golden pubescent stripes extending from the posterior margin of the second tergite to the apex of the abdomen, separated by a longitudinal black stripe; pygidial area

glabrous, impunctate; length, 7.5 mm. *Head* black, except the mandibles, clypeus, antennal tubercles, and antennae, ferruginous; mandibles edentate at the tips and with a small tooth within near the tip; clypeus elevated posteriorly, the elevated margin serrate; antennal tubercles slightly separated; scape not at all carinate beneath, with fine, sparse punctures and sparse, ferruginous pubescence; first and second segments of flagellum equal in length; antennal scrobes not carinate above; front and vertex with sparse, moderate punctures, the latter becoming closer at the posterior margin, the genae with moderate, close, deep punctures; front and vertex clothed with appressed, golden pubescence, sparse on the front and dense on the vertex (the front may possibly be densely pubescent and simply rubbed in the type specimen); genae elevated into a slight tubercle beneath posterior to the insertion of the mandibles; posterior margin of genae rounded, not at all carinate; postero-lateral angles rounded; relative widths of head and thorax, 3.3-2.5. *Thorax* ferruginous, except the pronotum black, the black almost interrupted medially by dull ferruginous, and a pair of lateral, elongate spots on the propodeum indistinctly infuscated; dorsum clothed with sparse, short, ferruginous pubescence, except the pronotum and lateral margins of dorsum with short, sparse, inconspicuous, black pubescence; pleural areas of pronotum with sparse, appressed, pale pubescence; thorax throughout with moderate, dense, deep, contiguous punctures; humeral angles rounded; anterior margin of propodeal spiracles elevated to form a small conspicuous tubercle; scutellar scale entirely absent. *Abdomen* ferruginous, clothed with sparse, recumbent, black pubescence, except the second tergite with a pair of small, anterior, linear spots, broad lateral margins, and a pair of large, transverse spots at the posterior margin, tergites three to five, each with a pair of large, transverse spots, and lateral thirds of last tergite, all with dense, appressed, golden pubescence, and the sternites clothed entirely with sparse, pale golden pubescence; first segment, seen from above, distinctly broader than long, clothed above with erect and appressed, pale golden pubescence; second tergite with moderate, dense, contiguous punctures throughout; tergites three to five with moderately large, close punctures anteriorly; pygidial area glabrous, impunctate; first sternite with a high, longitudinal carina from base to apex; second sternite with large, close punctures, except the posterior margin almost glabrous, impunctate; sternites three to five with small, close punctures at the posterior margin; last sternite with a low, transverse ridge at the base. *Legs* entirely ferruginous, sparsely clothed with ferruginous pubescence; calcaria pale.

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A NOTE ON THE GENUS *AUSTROLIMNIUS* C. & Z., WITH A  
DESCRIPTION OF A NEW SPECIES FROM FRENCH GUIANA  
(COLEOPTERA, ELMIDAE)

By H. E. HINTON, Ph.D.

(Department of Entomology, British Museum (Natural History)).

WITH 8 TEXT-FIGURES.

THE genus *Austrolimnius* was erected by Carter and Zeck (1929) in their monograph of the Australian DRYOPIDAE to contain two species described by King (1865) in the genus *Elmis* Latr. and two new species. In the same work these authors erected the genus *Neosolus* to contain a number of new species. In 1932 they sunk *Neosolus* as a synonym of *Austrolimnius*.

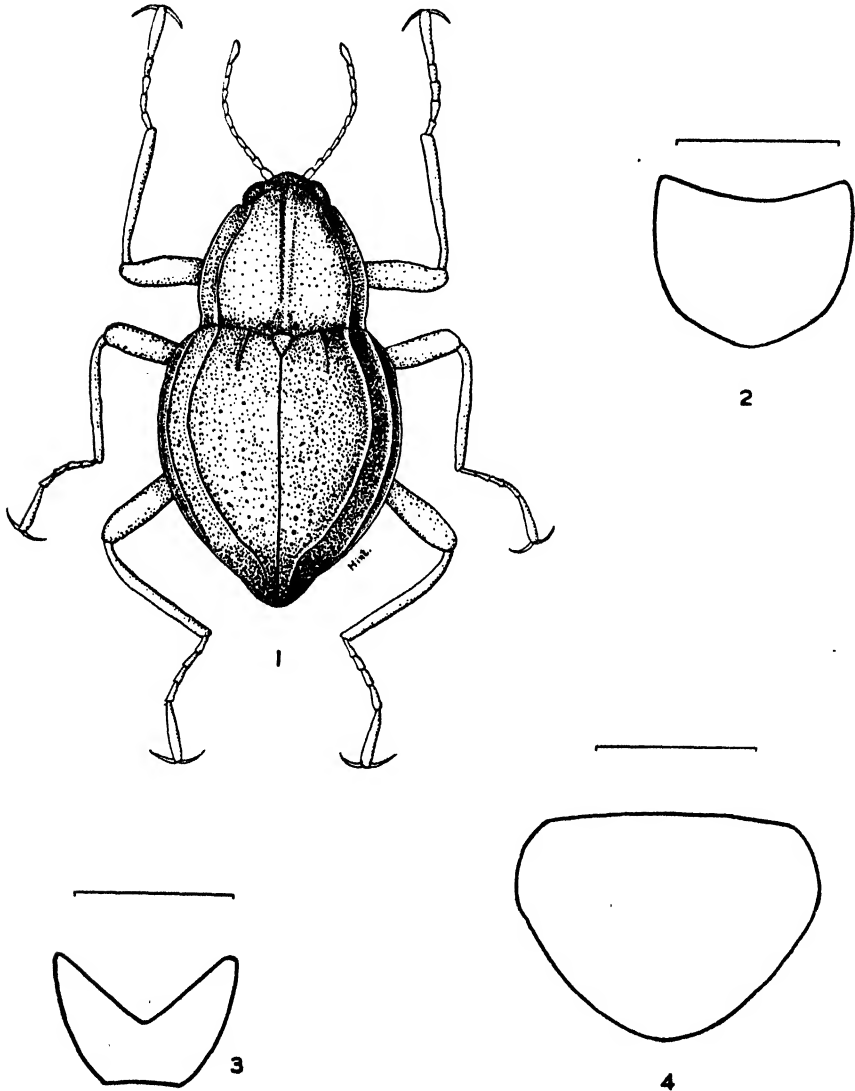
*Austrolimnius* is abundantly represented in Australia, there being now 10 species described from that continent, and is also widely distributed in South and Central America. The original description of the genus contains no mention of many characters of the external anatomy which are now known to be of the utmost importance in defining accurately the genera of ELMIDAE.

The line of close granules on the epipleura and the hind-wing with its very well-developed anal lobe and much reduced venation without an accompanying reduction in the length of the wing would seem to place *Austrolimnius* in a rather isolated position among the other members of its tribe. This conclusion is also supported by a recent study of the internal anatomy of which the most unusual features are the possession of a single sperm tube to each testis and the extraordinary degree of concentration of the abdominal ganglia of the central nervous system.

A re-description of the genus including both the characters of the external and internal anatomy is as follows :

Body obovate to subparallel. Dorsal surface glabrous or clothed with sparse and short recumbent hairs. Tomentum confined to the following areas: (1) genae; (2) epipleura; (3) occasionally (e.g. *A. luridus* C. & Z.) sides of elytra between inner margin of epipleura and outer sublateral carina; (4) hypomera; (5) sides of prosternum, mesosternum, metasternum, and abdominal sternites, but in some species nearly entire sternum of abdomen is clothed with fine tomentum; and (6) part or all of legs except tibiae and tarsi. Head when seen from below capable of being retracted so that none of mouth-parts is visible. Antennae 11-segmented. Mandibles with three apical blunt teeth; prostheca large and entirely membranous, with numerous fine spines or hairs apically. Maxilla with palp 4-segmented and stipes with a well-developed palpifer; galea and lacinia separate and apex of each densely spinose. Labium with palp 3-segmented and prementum with well-developed palpiger. Mentum transverse and about as broad as and two-thirds to three-fourths as long as submentum. Gula slightly narrower than submentum, about a third longer, and with sides nearly parallel. Pronotum with anterior margin moderately to strongly arcuate at middle and on each side behind eye before apical angle shallowly to deeply sinuate. Base tri-sinuate, broadly and moderately deeply so on each side and more narrowly and shallowly so in front of scutellum. Pronotum with sublateral carina on each side which extends from base nearly to apical margin and may or may not be prominent; disk with or without median longitudinal impression. Elytra impunctate or with distinct seriate punctures but seldom with striae which if present are only very feebly impressed;

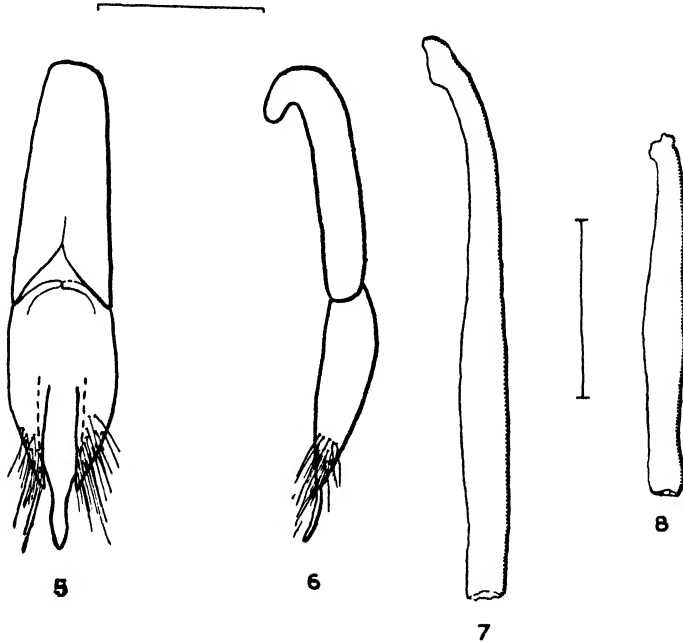
elytron with two prominent sublateral carinae. Epipleura with a longitudinal line of granules which on anterior two-fifths is half-way between dorsal and ventral margins, while on posterior three-fifths it is close and parallel to ventral margin. Hind-wings with venation much reduced; with well-developed anal lobe; without radial cross vein or anal



FIGS. 1-4.—*Austrolimnius musgravesi* sp. n. 1, general appearance; 2, dorsal view of apical abdominal tergite; 3, ventral view of sixth abdominal sternite; 4, ventral view of fifth abdominal sternite. Lines next to figures correspond to a length of 0.20 mm.

cell; first anal absent; second anal without branches; third anal only present basally and joined to second anal at extreme base; fourth anal short and indistinct; and cubito-anal cross vein arising from second anal at about middle of latter's length but not complete

to cubitus. *Prosternum* very long in front of anterior coxae; prosternal process long and very broad and posterior margin broadly rounded. Mesosternum with a broad and deep groove for reception of prosternal process. Metasternum with median longitudinal impressed line. *Legs* with externally visible portion of front coxae rounded and trochantin completely concealed by hypomera and sternum. Claws without teeth. *Alimentary canal* with five caeca on anterior margin of mid-gut. Hind gut with six Malpighian tubules which end near rectum freely or imbedded in fatty tissue. *Male reproductive system* with one sperm tube to each testis. Each lateral accessory gland lobed. Female reproductive system with two egg tubes to each ovary, and with spermathecal duct opening posterior



FIGS. 5-8.—5, dorsal view of male genitalia of *A. musgraveli* sp. n.; 6, right lateral view of same; 7, hind tibia of same species; 8, hind tibia of *A. curtulus* (Sharp). Lines next to figures correspond to a length of 0.20 mm.

to bursa copulatrix. *Central nervous system* with three thoracic discrete ganglia. First abdominal ganglion fused to third thoracic, second and third discrete, and fourth to eighth fused into a single large ganglion.

Genotype: *Austrolimnius politus* (King) (*Elmis*).

***Austrolimnius musgraveli* sp. n. (figs. 1-7).**

*Male*: Length, 1.43 mm.; breadth, 0.80 mm. Cuticle strongly shining and black; antennae, mouth-parts and legs rufo-piceous. *Head* with two feeble ridges each of which extends obliquely inwards from inner side near middle of eye to vertex but at vertex are not contiguous; surface microscopically alutaceous and with numerous flat-topped granules 0.015 mm. broad, or as coarse as facets of eyes, and usually separated by one diameter. Clypeus with fronto-clypeal suture deep, distinct, and nearly straight; anterior margin truncate and angle on each side very broadly rounded; surface with an occasional fine



granule and with numerous microscopic punctures. Labrum with anterior margin feebly rounded and angle on each side broadly rounded; surface smoother than that of clypeus and anteriorly at sides with numerous fine, long (0.11 mm.), golden-testaceous hairs which are erect to recumbent. *Pronotum* at broadest point, which is at basal third, slightly broader than long (0.60 mm. : 0.52 mm.) and base broader than apex (0.58 mm. : 0.35 mm.). Pronotum with carinae and impressions as figured (fig. 1); surface of disk with fine (0.007 mm. broad) punctures which are usually separated by one to two diameters; side between lateral margin and sublateral carina sculptured on anterior third somewhat like middle region of clypeus and on basal fourth or fifth with an asperate type of alutaceous microsculpture. *Elytra* about twice as long as pronotum (1.01 mm. : 0.51 mm.) and broadest point, which is between basal third and two-fifths, distinctly broader than broadest point across humeri. Lateral margins (*i.e.* inner margins of epipleura) nearly smooth. Apices conjointly produced and broadly rounded. Surface without striae; with three discal rows of seriate punctures which on middle disk are about 0.010 mm. broad and are separated longitudinally by five to seven diameters; towards apex punctures become denser and coarser so that on apical third they are twice as coarse and separated by three to four diameters; surface between seriate punctures moderately sparsely set with extremely fine microscopic punctures. Third (?) elytral interval with a very narrow and low carina (fig. 1) which extends from base 0.16 mm. posteriorly. Epipleura near inner margin from humeri to apical sixth with row of fine (not as broad as facets of eyes) close granules each of which is twice as long as broad; ventral to this with row of coarse granules which is present in all members of genus. *Scutellum* flat, subovate, and longer than broad. *Prosternum* with carinae prominent, nearly parallel, and extending to anterior margin; prosternum when viewed laterally with anterior two-fifths (not including process) moderately strongly but not sharply bent ventrally; process very broad (0.31 mm. opposite middle of anterior coxae) and middle apical third strongly depressed; surface moderately densely and microscopically punctate but surface of process more sparsely punctate and more highly polished. Hypomera with surface sculptured somewhat like middle of clypeus but with an occasional area of asperate microsculpture. Mesosternum with groove for reception of prosternal process very broad and not extending beyond posterior third. Metasternum with median longitudinal line indistinct but extending to anterior fourth; disk nearly flat, sparsely and microscopically punctate, and on each side near anterior two-fifths with a few closely placed long, recumbent, golden-testaceous hairs; carina on each side of disk prominent and nearly complete. Abdomen with no carinae on first sternite; fifth sternite broadly rounded at apex (fig. 4); sixth sternite as figured (fig. 3); apical tergite as figured (fig. 2). *Genitalia* (figs. 5-6) with median lobe narrowed before apex and extending much beyond lateral lobes. Apices of lateral lobes densely clothed with long and fine hairs.

*Type*: ♂, in the collection of the British Museum (Natural History). FRENCH GUIANA: St. Laurent du Maroni, alt. about 50 ft., 12.x.1937 (*H. E. Hinton*).

*Comparative notes*: This species appears to be most nearly related to *A. curtulus* (Sharp) of Panama, but may be distinguished as follows: (1) the longitudinal impression on the pronotal disk of *curtulus* is much deeper; (2) the sublateral pronotal carinae of *curtulus* are broader and more strongly raised, as is also the carina of the third interval of each elytron; and (3) the legs of *curtulus* are very much shorter (*vide* figs. 7-8). The males of *musgravei* may be distinguished at once from those of *sulcicollis* (Sharp) by the absence of a tooth on the hind tibia and teeth on the hind trochanter.

This species was found among dead leaves in a small stream (4 feet broad and 1-2 feet deep) in a rain forest. I take great pleasure in naming it in honour of Dr. P. N. Musgrave.

*Austrolimnius chiloensis* (Champ.).

1918. *Elmis chiloensis* Champ., *Ent. mon. Mag.*, **54** : 48.

1936. *Elmis prothoracica* Hinton, *Ent. mon. Mag.*, **72** : 56.

*A. chiloensis* (Champ.) is a typical member of the genus *Austrolimnius* C. & Z. It was sunk as a homonym of *Elmis chilensis* Germain (1854) through a misapplication of Article 35, Section A, of the International Code of Zoological Nomenclature.

BOOK NOTICE.

*A Contribution to the Biology of North American Vespine Wasps.* By C. D. DUNCAN. (Stanford Univ. Publ. Biol. Sci. 8, No. 1.) pp. 272, 255 figs. 8vo. London (Humphrey Milford). 1939. 15s.

This work is presented in four sections containing: 1. Introduction; 2. The morphology of *Vespula pensylvanica* (Sauss.); 3. Systematic considerations; 4. Biology of the VESPINAE.

The author has worked for 20 years on wasps in America and has specialised on *V. pensylvanica* which insect is described at great length and sufficient detail. Many entire colonies were collected and studied in the laboratory, and a careful census of their contents made. Field observations on individual wasps have supplemented these notes. Several thousand pinned specimens have been examined from many collections.

An exhaustive review of the literature has not been made, but the work of others has been used where it has seemed that the author's presentation of the facts would thereby be improved. Long-established facts have not been traced to their origin in the literature.

In addition to the many figures of details of anatomy and structure, a very large selection of illustrations of nests and their contents is given. The illustrations are successfully reproduced by half-tone reproduction on uncoated paper.

## NOTES ON THE COLEOPTEROUS FAMILY LANGURIIDAE AND DESCRIPTIONS OF A FEW NEW AFRICAN SPECIES

By Gilbert J. ARROW, F.R.E.S.

(*British Museum (Natural History)*).

IN 1929, *Proc. zool. Soc. Lond.* 1929, I published a list of the species of LANGURIIDAE known at that date to inhabit Africa and Madagascar, numbering 63 species in all, one-third of which were previously unknown. Having been enabled by the kindness of the staff of the Entomological Institute, Berlin-Dahlem, to compare the types in that collection with those in the British Museum, that list has become slightly reduced. These two collections contain, with very few exceptions, all the African types of LANGURIIDAE.

I am unable to regard *Anadastus brunneus* and *rufobrunneus*, of Kraatz, as two different species. The rather more prominent eyes and slenderer antennae of the latter probably indicate the male sex. The club of the antenna is described by Kraatz as 5-jointed in *brunneus* and 3-jointed in *rufobrunneus*, but this is misleading. The difference is extremely slight and I consider *rufobrunneus* a synonym of *brunneus*.

It is probable that *A. semirufus* Kr. (type in the Dahlem collection) is a variety of *A. semiflavus* Thoms. (type in the British Museum), but as I have seen only these two specimens, I prefer to await an opportunity of examining further examples before pronouncing judgement. The two specimens agree in all important respects, but Thomson's type is entirely red beneath, while that of Kraatz is dark beneath, with the head and prosternum only red.

A close examination of the type of *Anadastus dubius* Fowler shows it to be a discoloured specimen, in which the prothorax, normally bright red, is black, of the species described by me as *A. congoensis*, and *A. spectabilis* Kr., which differs only in having the legs also red, is a variety of it.

Only one African species, *Paracladoxena steelei* Arrow, has been added to the list up to the present time, but a few more are here described from the British Museum collection, bringing the total number to sixty-seven.

### *Anadastus alternatus* sp. n.

Lacte flavus, pronoto elytrorumque dimidio postico aeneoviridibus, antennis, basi excepto, femoribus et tibiis partim abdominisque parte posteriori nigris; nitidus, angustus, fere nudus, sed capite, elytris postico corporeque subtus minute vix perspicue griseo-setosis; capite et pronoto sat aequaliter, parum crebre punctatis, oculis sat magnis, prominentibus, pronoto latitudine fere ad longitudinem aequali, postice leviter contracto, angulis anticis obtusis, posticis acutis; elytris fortiter, haud crebre seriato-punctatis, intervallis fere impunctatis, apicibus truncatis; corporis subtus lateribus fortiter sat parce, medio minute et parvissime, punctato; antennis gracilibus, clava lata, triphylla. Long. 5.5-6.5 mm.

TANGANYIKA: Ukerewe I., L. Victoria (*P. A. Conrads*); UGANDA: Bukumbi (*H. Hargreaves*) July (type); W. AFRICA: Dahomey.

Type in the British Museum; co-types in Herr L. Mader's collection. Taken on Coffee by Mr. Hargreaves.

The wide distribution of this insect is remarkable. The single West African specimen is one of a small collection from Whydah and Abomey which reached

the Museum in 1853. The very peculiar coloration of the species renders it unmistakable. It is related to *A. dimidiatus* Guér., and *A. terminalis* Arrow, in which also the elytra are bright yellow in the anterior and blue-black in the posterior part. The head, dark in the other two species, is bright yellow in *A. alternatus*. The eyes are more prominent, the pronotum is more convex, less dilated in front, with blunter front angles and more rounded sides. The basal part is distinctly depressed and the lateral foveae, which in *A. dimidiatus* and *terminalis* are reduced to vestiges, are strong and deep.

***Anadastus socialis* sp. n.**

Rufo-flavus, pedibus (basi tarsisque exceptis) infuscatis, antennis rufis, clava nigra, elytrorum punctis brunneis; sat angustus, fortiter punctatus, pronoto transverso, postice valde contracto, distincte punctato, foveis basalibus profundis, sat longis, lateribus leviter bisinuatis, angulis anticis obtusis, posticis acutis; elytris fortiter seriato-punctatis, intervallis planis, fere impunctatis, apicibus truncatis; corpore subtus lateraliter fortiter punctato, lineis abdominalibus nullis; antennarum dimidio apicali nigro, clava triphylla sat lata. Long. 5-6 mm.

TANGANYIKA : Ukerewe I., L. Victoria (*P. A. Conrads*); KENYA : Simba, 3250 ft. (*S. A. Neave*) April; NYASALAND : Mlange (*S. A. Neave*) April (type); RHODESIA : Chirinda, Gazaland (*G. A. K. Marshall*) Dec.

Type in the British Museum; co-types in Herr L. Mader's collection.

This is nearly related to *A. natalensis* Gorh., but is darker in colour and more strongly punctured, the pronotum more transverse, more contracted behind, with long, strongly impressed, lateral foveae. It is related also to *A. lyctoides* Fowler, which is unknown to me, but in that species the pronotum is much longer than broad, the sides subparallel and the lateral foveae rather indistinct. It is described as pitchy-brown, including the underside, antennae and legs. The new species is deep yellow in colour, but the punctures are stained with brown, producing the appearance of a darker shade. The lower surface is reddish-yellow, the legs are black, except at the base, and the antennae red, with the club black.

***Anadastus gravis* sp. n.**

Nigro-coeruleus, capite prothoraceque laete rufis; parum angustus, sat brevis, convexus, punctatus, paulo nitidus, corpore subtus capiteque breviter griseo-setosis, hoc haud crebre punctato, oculis sat magnis, haud prominentibus; pronoto lato, sat fortiter punctato, lateribus antice paulo convergentibus, postice parallelis, angulis anticis rotundatis, posticis rectis, basi trisinuato, foveis lateralibus profundis, antice productis; elytris fortiter et crebre striato-punctatis, intervallis minute irregulariter punctatis, leviter rugulosis, apicibus haud distincte truncatis; corpore subtus ubique fortiter et aequaliter punctato; antennis brevibus, clava 4-articulata, modice lata. Long. 6-7 mm.

UGANDA : Entebbe (*S. A. Neave*) Jan.; Mt. Kokanjiro, 6400 ft. (*S. A. Neave*) Aug. (type).

Type in the British Museum.

*A. gravis* resembles *A. elytral* Arrow, but is shorter and stouter, as well as more strongly punctured. The head and prothorax are blood-red above and beneath, and the elytra, metasternum and abdomen blue-black, as well as the antennae and legs, the legs and lower surface with a greenish metallic lustre. It is not very shining, the whole surface, above and beneath, being strongly and evenly, but not closely, punctured. The pronotum is very

convex, scarcely contracted at the base, and the lateral foveae are large and deep.

**Anadastus egregius** sp. n.

Brunneo-viridis, aureo-nitens, parum elongatus, convexus, sat crebre punctatus, corpore subtus capiteque griseo-setosis, hoc fortiter punctato, oculis sat magnis, parum prominentibus; pronoto transverso, ubique aequaliter modice crebre punctato, lateribus antice fere parallelis, postice leviter convergentibus, angulis omnibus paulo productis, posticis acutis, basi paulo depresso, foveis lateralibus brevibus, profundis; elytris crebre et fortiter striato-punctatis, intervallis irregulariter paulo minutius punctatis; antennis robustis, clava lata, articulo ultimo transverso. Long. 6 mm.

UGANDA: Mujuga (*H. Hargreaves*) Mar. (type); Bukumbi (*H. Hargreaves*) July; Bursuma (*G. L. R. Hancock*) Mar.; Kampala Rd., Kafu R., 3500 ft. (*S. A. Neave*) Dec.

Type in the British Museum.

This is a strongly metallic species, of short and stout build and with little resemblance to any other known member of the genus. It is strongly and closely punctured, with the eyes not very small, the pronotum short and broad, the broadest part a little before the middle, and the sides very slightly converging before and behind. One specimen, which I believe to be the male, is more bright and shining, the puncturation of the upper surface is less strong and close, the eyes are a little more prominent and the 8th joint of the antenna is not distinctly transverse, so that the club is 3-jointed. In the other three specimens it is distinctly 4-jointed.

**Anadastus pallidisternum** sp. n.

Laete coeruleus, corpore subtus toto flavo, pedibus antennisque fere nigris, basi flavis; angustus, nitidus, capite modice punctato, vix perspicue setoso, oculis sat magnis, prominentibus; pronoto leviter transverso, minute et parce punctato, postice fortiter angustato, depresso, foveis lateralibus minutis, lateribus leviter bisinuatis, angulis anticis obtusis, posticis acutis; elytris grosse et profunde seriato-punctatis, intervallis paulo convexis, vix punctatis, humeris prominentibus, apicibus attenuatis, truncatis; corpore subtus parce albido-setoso, lateraliter fortiter punctato; pedibus antennisque sat gracilibus, horum clava 4-articulata, sat angusta et laxae articulata. Long. 5 mm.

TANGANYIKA: Ukerewe I., L. Victoria (*P. A. Conrads*) (type); UGANDA: Toro, Mpanga Forest, 4800 ft. (*S. A. Neave*) Nov.

Type in the British Museum; co-types in Herr L. Mader's collection.

This species closely resembles *A. latipennis* Arrow, also found in Uganda, but the entire lower surface is pale, whilst in *A. latipennis* the sternum is dark and the abdomen only pale. It is a rather more slender insect, the eyes are rather more prominent, the pronotum a little more contracted behind, the elytra narrower, more produced behind and rather less strongly and deeply punctured.

**Penolanguria flavicornis** sp. n.

Fusco-cuprea, antennis pedibusque flavis; angusta, nitidissima, capite punctato, griseo-setoso, oculis parvis, prominentibus; pronoto minute, sat aequaliter, haud crebre punctato, antice fortiter gibboso, postice angustato, lateribus leviter bisinuatis, angulis anticis rotundatis, posticis acutis sed haud productis; elytris convexis, minute sat numerose seriato-punctatis, dimidio posteriori attenuato; corpore subtus griseo-setoso, sterni lateribus sat fortiter punctatis; antennis gracilibus, clava haud lata. Long. 3.5-4.5 mm.

KENYA: W. Aberdare Mts., 10,000–11,000 ft. (*A. F. J. Gedye*) Nov.; (*H. J. Turner*) March, April; Gura, 7500 ft. (*R. E. Dent*) Aug.; Nanyuki, 5500 ft. (*A. F. J. Gedye*) Dec. (type); Meru, 5000 ft. (*A. F. J. Gedye*) Aug.

Type in the British Museum.

*Penolanguria flavicornis* closely resembles the type-species of the genus, *P. minuta* Kolbe. It is distinctly larger, the upper surface is dark metallic coppery, the legs and antennae, including the club, yellow. The head is more strongly punctured, finely hairy, the eyes a little larger than those of *P. minuta*. The punctures of the pronotum and elytra are fine, but rather less fine and distinctly more numerous than in the type-species, the pronotum is still more convex in its anterior part and its hind angles are sharp but not produced. The antennae are slender, the club rather loosely jointed and not broad.

*P. monacha* Kraatz, and *ovalipennis* Arrow, being more naturally assigned to the genus *Paracladoxena*, four species of *Penolanguria* remain. They may be tabulated as follows:—

- |        |  |   |   |                              |
|--------|--|---|---|------------------------------|
| 1 (4). | Antennae long, with narrow club.             |   |   |                              |
| 2 (3). | Brown, not metallic, the antennae not paler. | . | . | <i>minuta</i> Kolbe.         |
| 3 (2). | Upper surface coppery, antennae yellow       | . | . | <i>flavicornis</i> sp. n.    |
| 4 (1). | Antennae short, with broad club.             |   |   |                              |
| 5 (6). | Black; eyes rather large                     | . | . | <i>nigerrima</i> Kraatz.     |
| 6 (5). | Brown; eyes rather small                     | . | . | <i>callosipennis</i> Kraatz. |

#### BOOK NOTICE.

*Sveriges Skogsinsekter.* By I. TRÄGÅRDH. Andra . . . upplagen. 8vo. Stockholm (Geber). 1939. pp. xii + 509, 570 figs. Price 20 Kr.

This book is a new edition of Dr. Trägårdh's work on Forest Insects. The first six chapters deal with an order of insects and the seventh with Acarina. Chapter eight is concerned with harmful insects and forests, and chapters nine to twelve with methods of control and investigation, and chapter thirteen is a table for the identification of insects arranged under host trees on which they are to be found alive.

Whilst the book is obviously addressed in the first instance to the Swedish forester and forest entomologist, it will have a wider circle of users by reason of the many excellent illustrations. Many of the illustrations depict typical results of attack on trees by insects and should be useful as means of identification.

## A NEW SPECIES OF MALAYAN *TRAUlidea* (ORTHOPTERA- ACRIDIDAE)

By N. C. E. MILLER, F.R.E.S., F.Z.S.

(*Entomologist, Department of Agriculture S.S. and F.M.S.*)

THE new species described herein was captured in a garden adjoining an area of secondary jungle, from which it had presumably been driven by a fire. The type has been deposited in the collection of the British Museum (Natural History), London.

### *Traulidea vagans* sp. n.

Colour: Antennae castaneous; nine basal segments paler; segments 1 and 2 suffused with whitish on internal surface; 2 apical segments pale green. Eyes black, with the lower margin narrowly white. Head black with a stripe from apex of vertex bifurcating along inner margin of eyes to base, a stripe from scrobes to posterior margin of genae, a spot on frontal ridge, two spots on clypeus and mandibles, white; two pale ochreous spots on labrum; palpi pale green suffused with castaneous apically; labrum and mandibles greenish-black. Pronotum black with a lateral stripe on disc and a median stripe on lateral lobes white. Pleura with a median transverse white stripe; mesothoracic episternum with a white spot anteriorly. Elytra fuliginous with the reticulation along *vena media* and in costal area narrowly white. Wings fuliginous. Abdomen black with a narrow, longitudinal median stripe mid-dorsally and two spots on supra-anal plate white; sub-laterally and laterally dorsally and laterally ventrally on segments 4-7 suffused with greyish-blue and pale ochreous; apical margins of all segments ventrally suffused with pale greyish-blue. Anterior and median legs green; posterior femora black with the knee piceous, a pregenicular annulation white, genicular lobes, a narrow suffusion at each side of annulation and lower internal face bluish; posterior tibiae dark bluish-black, basally black and with a sub-basal bluish-white suffusion; spines black; basal segment of posterior tarsi bluish; remaining segments green.

Structure: Antennae extending beyond apex of abdomen. Eyes broadly ovate with anterior margin almost straight. Interocular distance a little shorter than width of frontal ridge between antennae; fastigium of vertex with a shallow elongate depression; vertex with scattered punctures; lower area of genae and face somewhat coarsely rugose punctate. Pronotum rugose punctate; median carina distinct but somewhat irregular; transverse sulci distinct, the second and third continued on lateral lobes; lower anterior margin of lateral lobes feebly concave; lower posterior margin straight. Prosternal spine acute, conical. Elytra somewhat narrow, narrowly rounded apically, extending to apical margin of 7th abdominal segment. Supra-anal plate triangular, rounded apically and with a longitudinal shallow depression basally and apically. Cerci simple, straight, acute apically. Posterior tibiae with 8 spines on inner and outer surfaces.

Total length 15.00 mm.; pronotum 3.20 mm.; elytra 7.20 mm.; posterior femora 9.00 mm.

Described from 1 ♂ (type): FEDERATED MALAY STATES, Kuala Lumpur, Selangor, 23.v.1939 (*N. C. E. Miller*).

The colour description is from a fresh specimen.

PROC. R. ENT. SOC. LOND. (B) 8. PT. 10. (OCTOBER 1939.)

## NEW SPECIES OF STAPHYLINIDAE (COL.) FROM AFRICA

By Malcolm CAMERON, M.B., R.N., F.R.E.S.

Types of the new species described here are in the collection of Mons. J. Clermont, unless otherwise stated, when they are in my collection as are the cotypes.

**Bledius (Pucerus) nodieri** sp. n.

Black; the head dull, the rest more shining; the elytra with a reddish-yellow marking occupying the postero-external region and extending from almost the apex of the suture to a little behind the middle of the reflexed margin; the last segment of the abdomen yellowish. Antennae and legs reddish-yellow. Length 2.5 mm. Size and build of *husseini* Quedf., the antennae similarly constructed but at once distinguished by the colour of the elytra; the sculpture of the head and thorax scarcely differs in the two species, but the posterior angles in *nodieri* are completely effaced and the elytra are obviously more coarsely and deeply punctured. In all other respects like *husseini*.

H. SÉNÉGAL: Badoumbé (*Nodier*).

**Lithocharis atriceps** sp. n. (Fauvel *in litt.*).

Head black, greasy lustrous, the rest more shining, thorax and abdomen yellowish-red, elytra reddish-yellow. Antennae and legs reddish-yellow. Length 3 mm. Colour, size and lustre of *sororcula* Kr. but with the head not so broad, as broad as long, the puncturation much coarser and deeper; the antennae as in that species; thorax more finely and scarcely as closely punctured, the elytra more finely and more closely punctured than in *sororcula*, the abdomen as in that species, closely and finely punctured and pubescent throughout.

♂. 5th sternite truncate and in the middle with short black teeth closely placed: 6th with rectangular excision. These characters are very like those of *sordida* Cam., but the pectinate region of the 5th sternite is broader than in that species and the excision of the 6th is broader and rectangular.

BRITISH SOMALILAND: Dolphin Bay (*Cameron*) Type. H. SÉNÉGAL: Badoumbé (*Nodier*).

**Cryptobium externum** sp. n. (Fauvel *in litt.*).

Rather shining, black, the posterior margin of the elytra narrowly, the postero-external angle more broadly, reddish-yellow. Antennae reddish. Legs yellow. Length 6 mm.

Very near *cribripenne* Epp. but less coarsely punctured and with the posterior margin of the elytra reddish-yellow. Head oblong, the sides parallel behind the rather prominent eyes, the posterior angles broadly rounded, the whole surface except for a narrow area along the anterior border, closely and rather coarsely punctured. Antennae with the intermediate joints longer than broad, decreasing in length, the 7th to 10th as long as broad. Thorax distinctly longer than broad, the sides feebly rounded in front, slightly sinuate and a little retracted behind, along the middle with rather broad, somewhat raised impunctate area, elsewhere coarsely and closely punctured like the head. Elytra a little longer than the thorax, a little more coarsely and more closely punctured. Abdomen finely and closely punctured throughout.



♂. 2nd and 3rd sternites with a short transverse ridge across the middle; 5th with a broad nearly parallel-sided glabrous impression along the whole length; 6th deeply, broadly arcuately emarginate.

H. SÉNÉGAL : Badoumbé (*Nodier*).

***Conosoma senegalense* sp. n.**

Head black, the front reddish-yellow: thorax blackish, with the base and sides broadly reddish-yellow: elytra red with a large spot occupying the side (except the shoulders and apex), and a narrow sutural mark (sometimes indistinct) not reaching the base or apex, pitchy-black: abdomen with the first two visible segments reddish-yellow, the following black. Antennae reddish-yellow, the 4th to 6th joints infusate. Legs reddish-yellow. Length 2 mm. (abdomen retracted).

Size and convex build of *bipunctatum* Gr. but of different colour and the elytra without lateral setae. Head with a few minute punctures; ground-sculpture absent. Antennae slender, extending to about the posterior angles of the thorax, the penultimate joints as long as broad. Thorax transverse (7.3:5), the sides gently rounded, more retracted in front, extremely finely, very closely punctured (much more finely and closely than in *bipunctatum*) and without ground-sculpture. Elytra a little longer (5.5:5) than the thorax, broader than long, a little narrowed behind, as closely and as finely punctured; abdomen densely and finely punctured, the sides with long black setae. Except for the head, the whole insect is closely covered with a fine, close yellow pubescence.

H. SÉNÉGAL : Badoumbé, 1.v.1882 (*Nodier*).

***Zyras (Camonia) militaris* sp. n. (Fauvel *in litt.*).**

♂. Fore-parts greasy lustrous; head and elytra black, the latter with the base and shoulders obscurely reddish-yellow; thorax red: abdomen shining, the first three visible segments red, the following black. Antennae reddish-brown. Legs reddish-yellow. Length 8 mm.

A large parallel species, very like *schuberti* Bernh. but differing in the longer, very finely but distinctly punctured thorax, the colour of the abdomen, the slightly stouter antennae and the coriaceous frontal tubercle. Head transverse, as broad as the thorax, the eyes large and prominent, much longer than the rounded postocular region, the disc flattened, between the insertion of the antennae with a large tubercle, not shining but more strongly coriaceous than the rest of the surface which is also very finely and not closely punctured. Antennae rather stout, extending a little beyond the base of the elytra, the penultimate joints distinctly transverse, the 11th about as long as the three preceding together.

Thorax slightly transverse (5.3:5), trapezoidal, the sides rounded for the anterior two-fifths, straight and retracted behind, along the middle rather broadly but superficially impressed for the posterior three-fourths and with trace of an impressed (but not shining) line, the whole surface coriaceous like the head, finely, not closely punctured, the punctures closer and less fine on the disc than elsewhere. Elytra broader and a sixth longer than the thorax, a little wider behind, coriaceous and a little less finely punctured than the thorax. Abdomen nearly parallel, almost impunctate, the ground-sculpture very feeble, the 3rd segment with a pair of long, strong pointed processes curved at the base and overlying the lateral margin to the posterior margin of the 5th segment, the inner aspect of the basal half with four or five little tubercles, the space between the bases of the processes deeply, triangularly impressed: 6th segment with a tubercle in the middle and a transverse row of four very small ones near the posterior margin: 7th with four

little tubercles more or less quadrately placed; 8th nearly truncate, the surface with a few small granules. The whole insect practically glabrous.

H. SÉNÉGAL : Badoumbé l.v.1882 (*Nodier*).

**Zyras (Grammodonia) fauvelianus** sp. n. (*biseriata* Fauv. *in litt.*).

Shining : head blackish, reddish in front, the rest yellowish-red. Antennae reddish-brown, the first two joints and legs reddish-yellow. Length 5 mm. Very like *frontalis* Er. in size and colour, but with stouter antennae, the thorax with the sides straighter behind, the posterior angles distinct and obtuse and with a dorsal row of small, more or less paired punctures on each side of the smooth median line and elsewhere less finely and less uniformly punctured, the elytra also a little shorter and less closely punctured than in that species. It would also appear to be very near *bilineatus* Bernh. but of larger size, the head finely and sparingly punctured, the thorax with distinct obtuse posterior angles and feeble lateral impression, the elytra broader than long and the abdomen almost impunctate. Head narrower than the thorax, transverse, the eyes large, much longer than the rounded temples, convex, finely and sparingly punctured and without ground-sculpture. Antennae moderate in length, the 3rd joint as long as the 2nd, 4th scarcely, 5th to 10th more strongly transverse, the penultimate about twice as broad as long, the 11th nearly as long as the three preceding together. Thorax slightly transverse, the sides straight and retracted behind, the posterior angles distinct and obtuse, at the sides feebly obliquely impressed postero-externally, before the scutellum with small transverse impression; on each side of the impunctate median area with a double row of small, closely placed, more or less paired punctures, externally with a nearly impunctate region, towards the sides finely and moderately closely punctured; ground-sculpture absent. Elytra very slightly longer than the thorax, slightly broader than long (5 : 4), moderately finely, rather sparingly punctured. Abdomen almost impunctate.

H. SÉNÉGAL : Khayes, 11.xii.1881 (*Nodier*).

### BOOK NOTICE.

*A laboratory introduction to animal ecology and taxonomy.* By O. PARK, W. C. ALLEE and V. E. SHELFORD. 8vo. Chicago (University of Chicago Press, Cambridge University Press). 1939. Price 10s. pp. x + 272, 17 figs.

This unusual volume is printed on single leaves and bound by a series of stout metal rings in a cover. By this means the book always lies flat when open if care be taken not to tear the leaves.

The work was produced to meet the needs of University teachers and is based on experience in teaching requirements. It is a laboratory guide with keys prepared with particular reference to freshwater and terrestrial habitats of the deciduous forest region in North America.

An introduction on the inter-relationship of animals with their environments is followed by a series of "Exercises" on terrestrial and freshwater animals in the form of inspired questionnaires.

Next is given a series of synoptic keys to the Phyla of the animal kingdom.

A glossary, bibliography, taxonomic index and subject index complete the book.

# ZWEI WENIG BEKANNTE *HETRODES*-ARTEN (ORTHOPTERA, TETTIGONIIDAE)

Von Dr. R. EBNER.

(Wien.)

Communicated by B. P. UVAROV, D.Sc., F.R.E.S.

BEI der Bearbeitung der Hetrodinen für den *Orthopterorum Catalogus* kam ich sehr bald auf *Hetrodes variolosus* Fieber. Diese Art wurde 1853 ohne Angabe der Herkunft recht gut beschrieben, aber von den späteren Autoren kaum mehr berücksichtigt; Kirby führt sie 1906 als fraglich bei *Hetrodes* an. Da mir die Type im Wiener Museum zur Verfügung stand, nahm ich eine kurze Untersuchung vor: sie ergab die sichere Einreihung in das Genus *Hetrodes*. Ich gebe im nachfolgenden eine Neubeschreibung dieser kaum bekannten Art, sowie die Beschreibung einer anderen interessanten Form aus dem Wiener Museum.

## *Hetrodes variolosus* Fieb. (figs. 1-3).

Fieber, 1853, *Lotos* 8: 259, ♀; 1854, *Syn. Eur. Orth.*: 75, ♀.

Kirby, 1906, *Syn. Cat. Orthopt.* 2: 154 (*H. (?) variolosus*).

Ebner, 1939, *Orthopt. Cat.* 2: 75.

♀. Das Tier ist sehr schlecht erhalten. Der Kopf ist nur noch zu einem kleinen Teil vorhanden, Pronotum mit einigen Löchern, von den Beinen ist überhaupt nur mehr der Schenkel des linken Mittelbeines erhalten (14 mm. lang).

Grau bis dunkelbraun, Abdomen jederseits mit einem helleren Längsstreifen. Ovipositor oben an der Basis mit einem dunkleren Längsstreifen, auch gegen die Spitze zu dunkler. Kopf zwischen den Antennen mit stumpfem Dorn. Pronotum oben matt, mit vielen kleinen runden Eindrücken, sodass es wirklich wie blatternartig aussieht. Seiten des Pronotums glänzend, mit kleineren Eindrücken. Prozona des Pronotums lang und von 14 Dornen umgeben; davon stehen an jedem Seitenrand 5, am Vorder- und Hinterrand der Prozona je 2 Dornen; ausserdem ist an der linken Seite am Vorderrand noch 1 ganz kleiner Dorn. Prozona hinter der Mitte mit 2 kurzen aufrechten Dornen, in deren Umgebung etwas runzelig. Metazona des Pronotums jederseits mit 8 Dornen, von denen die 2 vorderen am grössten sind; 6. und 7. Dorn besonders klein. Vordercoxen stark bedornt. Linker Mittelschenkel aussen mit 2 Reihen von runden Eindrücken, unten an der Aussenseite mit 2 Dornen. Abdomen mit 7 Längsreihen von Dornen, von denen die der zweiten, vierten (= mittleren) und sechsten Reihe viel grösser sind als die der 4 übrigen Reihen. Zwischen der 2. und 3., sowie zwischen der 5. und 6. Reihe befinden sich die beiden hellere Längsstreifen. Abdominal-Segmente ausserdem mit zahlreichen sehr kleinen Tuberkeln. Cerci kurz und spitz. Subgenitalplatte gross und breit, aber wegen des ganzen Erhaltungszustandes im basalen Teil schlecht zu sehen, am freien Rand flach und ausgebuchtet, hinten in der Mitte mit einem kurzen Längseindruck. Ovipositor anfangs ziemlich gerade, dann deutlich nach aufwärts gebogen und namentlich unten gegen die Spitze gesägt.

Körperlänge ca. 36 mm.

Pronotum 14.5 mm. (Prozona 9.5 mm.)

Ovipositor 19 mm.

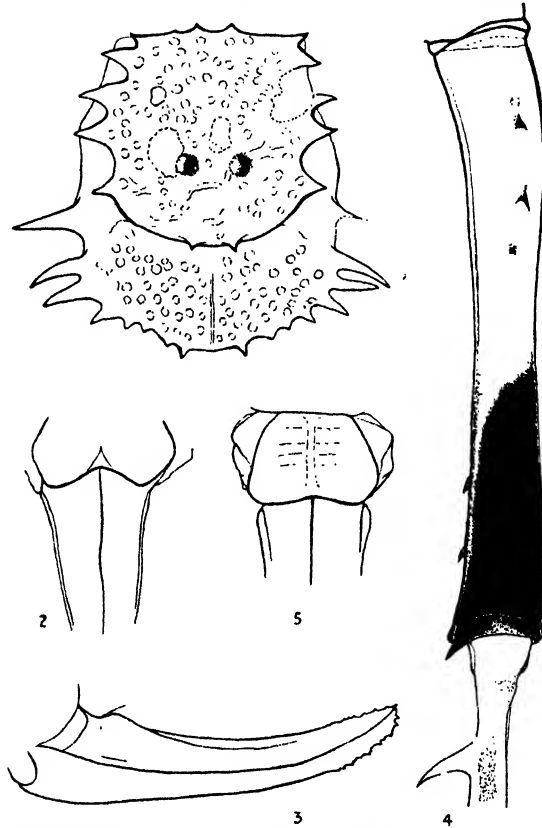
Patria ?

1 ♀, Type. Coll. Brunner von Wattenwyl, No. 9713, ex coll. Fieber.

Wenn auch der Fundort nicht bekannt ist, so ist wohl kaum zu zweifeln, dass das Tier aus dem Kapland oder mindestens aus Süd-Afrika stammt.

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Obwohl schlecht erhalten, gestattet das Tier doch die sichere Einreihung in das Genus *Hetrodes* Fisch.-Waldh. Von der bekanntesten Art *pupus* L. (1758) weicht das vorliegende Tier sicher ab: vollkommen andere Skulptur des Pronotums, Prozona des Pronotums sehr lang, Ovipositor viel kürzer, Subgenitalplatte anders beschaffen. Aber bei der beträchtlichen Variabilität, welche anscheinend die meisten Arten dieser Gattung namentlich bezüglich der Bedornung zeigen, ist ein Vergleich damit nicht leicht. Am ehesten käme noch *marginatus* Walk. (1869) in Frage. Die für *variolosus* so typische Skulptur



FIGS. 1-3.—*Hetrodes variolosus*; 1. ♀, Pronotum von oben; 2. ♀, Subgenitalplatte und Basis des Ovipositors; 3. ♀, Ovipositor von der Seite.

FIGS. 4-5.—*Hetrodes namaqua* ab. *maculipes*; 4. ♀, rechter Hinterschenkel von oben; 5. ♀, Subgenitalplatte.

des Pronotums ist wenigstens teilweise auch bei *knysna* Pér. (1916) = *marginatus* Walk. vorhanden; jene Art ist aber durch 6 Dornen am Pronotumvorderrande von *variolosus* verschieden. Aber wenn auch *variolosus* mit einer anderen Art identisch sein sollte, so muss der Name nach seinem Alter (1853) unbedingt erhalten bleiben.

***Hetrodes namaqua* Pér. *maculipes* ab. n. (figs. 4-5).**

♀. Beide Antennen, rechtes Vorderbein und rechtes Mittelbein fehlen. Körper oben ziemlich dunkelbraun, an den Seiten und unten hellbraun. Alle Schenkel glänzend,

gelbbraun, oben distal mit einem grossen braunschwarzen Fleck. *Kopf* mit einem kurzen und ziemlich spitzen Dorn zwischen der Basis der Antennen. *Pronotum* lang, seine ganze Oberfläche runzelig, nur die hintere Hälfte der Prozona trägt mehrere ziemlich grosse, glatte, helle Stellen. Seitenlappen des Pronotums fein gerunzelt und namentlich in der hinteren Hälfte glänzend. Alle Ränder des Pronotums etwas heller und besonders an den Seiten aufgeworfen. Prozona des Pronotums am Vorderrand mit 4 Dornen. An jeder Seite der Prozona stehen 4 starke Dornen; auf den letzten folgt unmittelbar jederseits 1 ganz kleiner Dorn, der eigentlich schon zum Hinterrand der Prozona gehört. Ausserdem befinden sich am Hinterrand nahe der Mitte noch 2 Dornen. Die Prozona ist also im ganzen von 16 Dornen umgeben, von denen die 8 seitlichen am grössten sind. Diskus der Prozona hinter der Mitte mit 2 kurzen aufrechten Dornen. Metazona des Pronotums jederseits mit 7 Dornen, die von vorn nach hinten an Grösse abnehmen, doch ist der letzte Dorn (nahe der Mitte des Hinterrandes) wieder grösser. Vordercoxen in einen kräftigen spitzen Dorn ausgezogen. Vorderschenkel aussen ohne Dornen, innen vor der Spitze mit 1 ganz kleinen Dorn. Mittelschenkel aussen mit 2 Dornen, innen mit 1 Dorn an der Unterseite. Hinterschenkel oben im basalen Teil mit 3–4 Dornen, unten an der Aussenseite mit 3, an der Innenseite mit 2 Dornen. Hinterschenkel distal an der Innenseite in einen spitzen Dorn ausgezogen. Hintertibien aussen mit 4, innen mit 5–6 Dornen, von denen die vorderen sehr lang sind. Abdomen mit 3 ziemlich gleich grossen Längsreihen von Dornen, ausserdem durch feine Tuberkel etwas rauh erscheinend. Cerci kurz und spitz. Subgenitalplatte trapezförmig, nach hinten verbreitert, in der Mitte namentlich an der Basis mit stumpfem Längskiel, am Hinterrand leicht ausgebuchtet. Ovipositor gleichmässig nach aufwärts gebogen und gleichmässig gegen das Ende verschmälert, daselbst namentlich an der Unterseite deutlich gesägt.

Körperlänge 38 mm.

Pronotum 17.5 mm.

Hinterschenkel 24.5 mm.

Ovipositor 23.5 mm.

CAPLAND: Cap.

1 ♀, Type der Aberration. Coll. Brunner von Wattenwyl, No. 17898, ex Mus. Lübeck.

Ich hielt das besprochene Exemplar zunächst für eine neue Art, die *abbreviatus* Walk. (1869) und *namaqua* Pér. (1916) nahe steht, sich aber von beiden durch längeres Pronotum, viel längeren Ovipositor und vor allem durch die grossen dunklen Flecken im distalen Teil der Schenkel-Oberseite unterscheidet. Obwohl im allgemeinen Färbungsmerkmale bei Orthopteren nur ausnahmsweise zur Kennzeichnung einer Art herangezogen werden können, hielt ich in diesem Fall die dunklen Flecken für sehr charakteristisch. Ich gab die wichtigsten Merkmale der vermutlich neuen Art ganz kurz Herrn Dr. B. P. Uvarov in London bekannt und bekam darauf von ihm eine sehr interessante Mitteilung. Er hält es für möglich, dass mein Tier zu *H. namaqua* Pér. gehört, da eine der Paratypen (jetzt im British Museum) ebenso gefärbte Beine hat. Der Ovipositor misst nach brieflicher Angabe von Uvarov 23 mm. und nicht 13–15 mm. wie Péringuey (1916, *Ann. S. Afr. Mus.* 15: 430) angibt! Nach dieser Berichtigung und Ergänzung zweifle ich nicht mehr daran, dass mein Exemplar nur eine Farben-Aberration von *namaqua* ist, da die sonstigen von Péringuey genannten Merkmale auch dem vorliegenden Tier zukommen. Doch dürfte meine ausführliche Beschreibung die Art leichter erkennen lassen. Die Aberration ist wohl nur durch die auffallende Färbung der Schenkel besonders gekennzeichnet.—Ich bin Herrn Dr. B. P. Uvarov für seine Hilfe sehr zu Dank verpflichtet.

## THE BETHYLIDAE SUBFAMILY SCLEROGIBBINAE (HYMENOPTERA)

By O. W. RICHARDS, F.R.E.S.

I HAVE recently received from my friend Mr. E. McC. Callan a series of both sexes of a remarkable parasite which he bred from Embiids in Trinidad, B.W.I. The proper identification of these specimens necessitated a revision of the group to which they belong. I am much indebted to Mr. R. B. Benson of the British Museum (Natural History) for enabling me to study the material there; to Sign. Dott. Delfa Guiglia and to the director of the Museo civico di Storia naturale, Genova, for the loan of two types and to Dott. Guiglia for information about other specimens; to Dr. C. F. W. Muesebeck and to the authorities of the United States National Museum for the loan of specimens and to Dr. Muesebeck for information as to the type of *Probethylus* Ashmead; to Herr Dr. H. Sachtleben and to the authorities of the Deutsches entomologisches Institut for the loan of a type. To Mr. Callan I am particularly indebted for allowing me to study his very valuable insects.

### *Probethylus* Ashmead, 1902.

Female (only *P. callani* sp. n. known). Ocelli in an equilateral triangle, the posterior ones much nearer to one another than to eyes; mandibles with three distal teeth; maxillary palpi with three segments, labial with two; metanotum not developed; mid tibiae with one spur.

Male. Eyes not separated from occiput by more than one or two ocellar diameters; second radial ("marginal") cell longer, its costal margin longer than sector of media which forms posterior margin of first radial ("cubital") cell; vein Cul extending only as a short stump beyond mcu. Type (monobasic) = *Probethylus schwarzi* Ashmead, 1902.

### *Probethylus schwarzi* Ashmead, 1902.

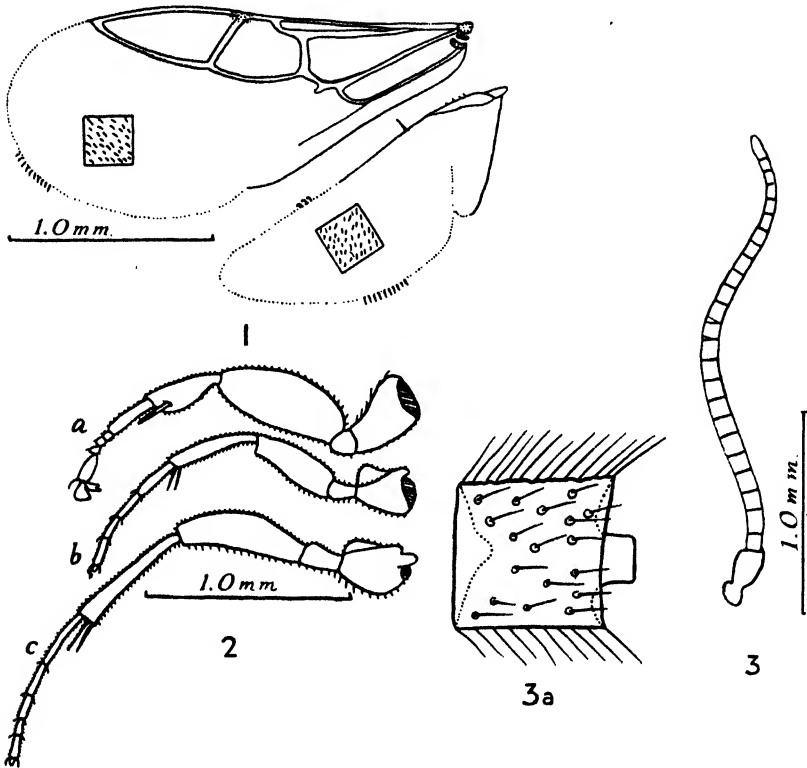
Ashmead described (in just sufficient words to make the name valid) this species from Arizona. Dr. C. F. W. Muesebeck has kindly supplied me with the following information. It is very close to *P. mexicanus* sp. n. described below (p. 216) but the eyes are slightly smaller and rather more widely separated from the occiput. The antennae have twenty-two segments. The propodeum is more evenly punctate without the irregular rugosities. Fore-wing with first radial cell distinctly shorter than the second radial cell, Rs more strongly bent. Notaulices very weak, not punctate, not extending half-way across mesonotum.

### *Probethylus callani* sp. n.

Female. Reddish-testaceous; posterior half of head dorsally, eyes, part of head behind buccal cavity ventrally, scutellum, mesopleuron, small antero-dorsal mark on propodeum, most of mid and hind femora, black or blackish; abdomen brown, anterior part of each tergite darker. Surface covered with microscopic, pale, appressed pubescence which is sericeous and more conspicuous on the abdomen. Length 2.0-2.75 mm.

Head dull, alutaceous, unpunctured, in dorsal view (fig. 10) short-pyriform, somewhat pointed anteriorly, truncate behind, a little longer than greatest width across eyes, inner orbits diverging anteriorly, the distance between the eyes anteriorly about one and a half

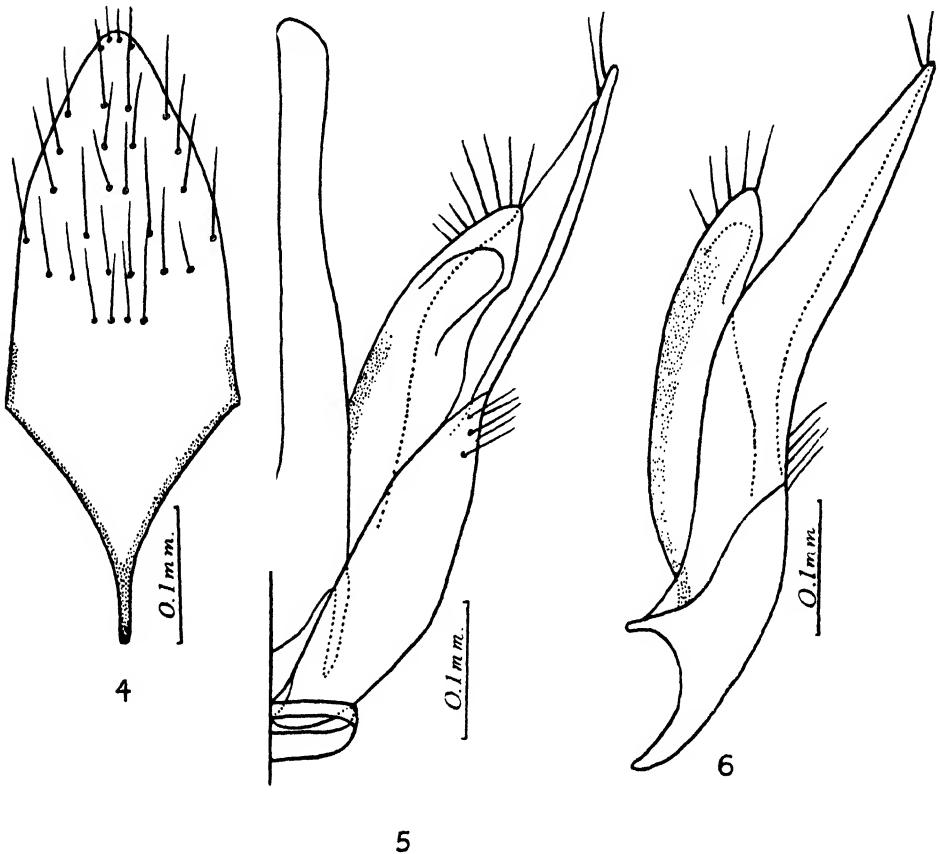
times distance between them posteriorly, area between eyes feebly convex, a feeble circular impression in mid-line just behind front margin; ocelli minute, in an equilateral triangle,  $POL: OOL = 1$ , posterior ocelli separated by about their diameter from occiput; eyes very large, pubescent, about half as wide in dorsal view as distance between them, separated from antennal socket by three-quarters length of antennal segment 1, from mandibles by half width of same segment, from occiput by about two ocellar diameters; antennae (fig. 9), gradually tapering, of 20–23 segments, 1 thick, about twice as long as broad, 2 transverse, 3-penultimate quadrate or a little longer, last segment rather more than twice as long as broad; clypeus hidden beneath antennae on ventral aspect of head, very transversely



FIGS. 1–3.—*Probethylus callani* sp. n. 1, wings ♂; 2 a, b, and c, fore, mid and hind legs, ♂; 3, antennae, ♂; a, segment 13 more magnified.

triangular, central part convex, ventral margin truncate, labrum not visible; mandibles narrow, strap-shaped with three distal teeth; maxillary palpi with three segments, third a little longer than first, second hardly more than half as long as third, labial palpi with two segments of about equal length; buccal cavity rather narrowly separated from the foraminal depression which, like occiput, is unmarginated. Wings absent; thorax and propodeum dull, alutaceous, unpunctured; pronotum about twice as long as broad, a little broader in front than behind, dorsally nearly flat, lateral aspect at right angles to dorsal, also flat, posterior margin moderately emarginate with mesonotum appearing as small plate just filling in emargination; scutellum well-defined, long-horseshoe-shaped, a little longer than broad, its posterior half inserted into propodeum; metathorax not separately developed; propodeum with dorsal and posterior surfaces in a continuous, gentle curve, transition to

lateral surfaces also gradual, in dorsal view broadest at middle, a little longer than broad; propisternum very globose, the two halves almost fused at mid-line. Fore legs (fig. 7) strongly thickened, femur in resting position lying along sides of pronotum, fore tibia with ventral edge laminate, basitarsus (fig. 8) with an anterior row of 16 peg-like structures, segments 2-3 each with three pegs, segments 2-4 short, 5 about three-quarters as long as 1, empodium very large, claws bifid; mid coxa with strong antero-dorsal, hind coxa with very strong antero- and postero-dorsal keels, mid and hind femur somewhat grooved ventrally to receive tibia, mid tibia with one long and one microscopic (only visible in balsam mount



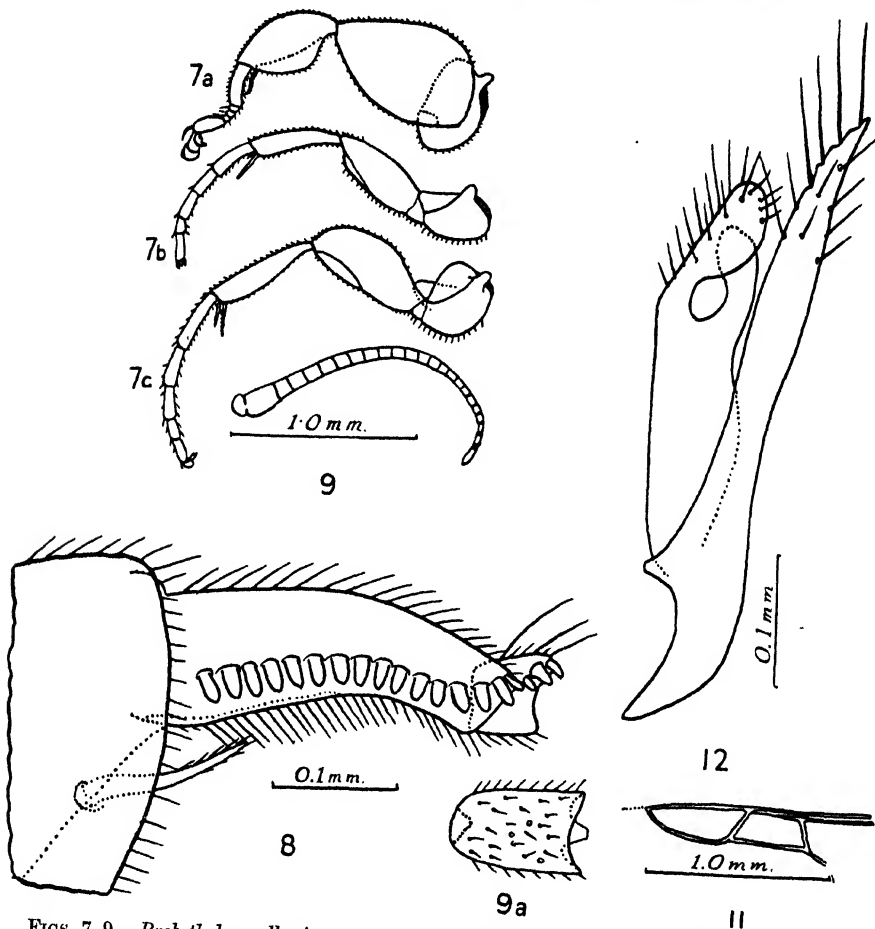
FIGS. 4-6.—*Probethylus callani* sp. n. 4, morphological ninth sternite, ♂; 5, left half ♂ genitalia, dorsal view; 6, right half ♂ genitalia (without parameres), ventral view.

under high magnification) spur, hind tibia with two long spurs of which inner one is strongly pectinate, tarsus longer than corresponding tibia, claws bifid. Abdomen not quite as long as thorax + propodeum, strongly pointed behind, with six visible segments, first campanuliform, longer than others, 2-5 transverse, 6 elongate-triangular; sting usually a little projecting.

Male. Black; small area to which antennae are attached, antennae, mandibles and other mouthparts, fore and mid tibiae and tarsi, hind tarsi pale yellow-brown; coxae, femora and hind tibiae and tegulae darker brown. Wings hyaline, venation very pale. Whole surface covered with moderately close, semi-erect, short, brown pubescence. Length 2.0 mm.



Head dull, very finely, hardly perceptibly punctured (more shagreened), in dorsal view nearly circular but (including eyes) a little transverse, front margin of circle produced into small, transverse, subrectangular plate to which antennae are attached; inner orbits almost parallel, hardly diverging anteriorly, area between eyes very feebly convex, about one half times longer than broad, ocelli moderately large, in an equilateral triangle, POL :



FIGS. 7-9.—*Probethylus callani* sp. n. 7 a, b, and c, fore, mid and hind legs of ♀; 8, fore tarsal segments 1-3, ♀; 9, antennae, ♀; a, segment 13 more magnified.

FIGS. 11-12.—11, *P. mexicanus* sp. n. fore-wing, region of pterostigma, ♂; 12, ♂ genitalia, left half (without parameres), dorsal view.

OOL = 3 : 2 (or 4 : 3), posterior ocelli separated by twice their diameter from occiput; eyes very large, pubescent, about two-fifths as wide in dorsal view as area between them, separated from mandibles by about half width of antennal segment 1, from occiput (in side view) by hardly more than an ocellar diameter; antennae (fig. 3) with 20-25 segments, in structure as in female but with somewhat longer pubescence; clypeus, mouthparts and foraminal depression similar. Pronotum dorsally rather coarsely granulate, strongly transverse, posterior margin broadly emarginate, anterior corners distinctly angulate, sides diverging a little posteriorly, about two and a half times as long as length at mid line,

anterior limit of dorsal aspect falling almost perpendicularly to attachment of head, lateral aspect subrectangular, smooth and shining; mesonotum moderately shining (in Mexican specimen more shagreened), closely but shallowly punctured, notaulices and parapsidal furrows complete; scutellum two-thirds as long as mesonotum, finely punctured; metanotum ("postscutellum") very narrow; propodeum with dorsal and posterior surfaces very coarsely granulate, lateral surfaces more shining, finely granulate, posterior surface moderately truncate; mesopleuron rather dull, finely punctured, prepectus sharply marked off, no central circular pit, mesosternum not separated off by a furrow, centrally with strong longitudinal depression; metapleuron hardly separated from propodeum, almost obliterated below. Wings as in fig. 1 (first and second radial cells somewhat more

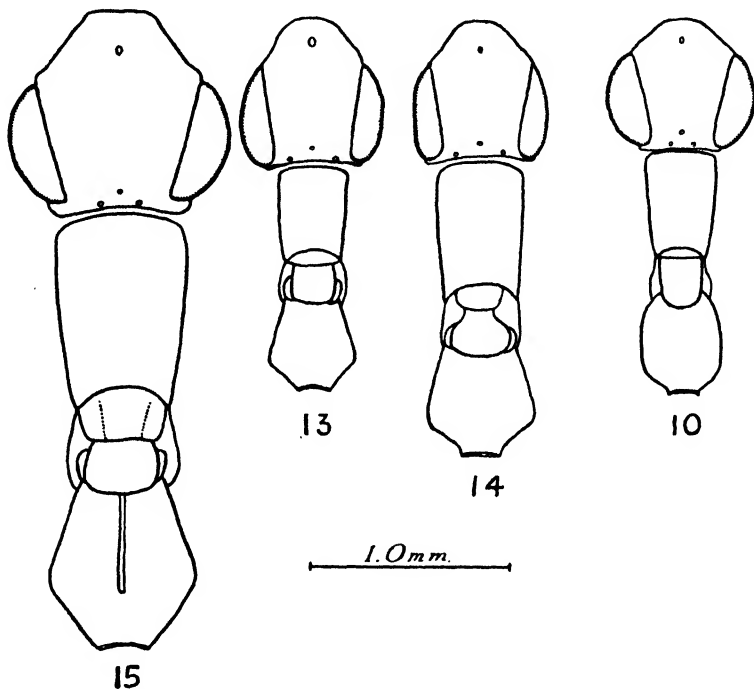


FIG. 10.—*P. mexicanus* sp. n. head, thorax and propodeum, ♀.

FIGS. 13–15.—13, *Sclerogibba africana* (Kieff.). Head, thorax and propodeum, ♀; 14, *S. embiidarum* (Kieff.), the same, ♀; 15, *S. magretti* (Kieff.), the same, ♀.

elongate in Mexican specimen), with short marginal fringe; hind-wings with one straight proximal and three curved distal hamuli. Legs (fig. 2) similar to female but less thickened, fore tarsus with no peg-like structures, mid tibia with two spurs of equal length. Abdomen shining, flattened dorsally, posteriorly somewhat pointed, as long as thorax + propodeum, with seven visible segments; morphological ninth sternite (fig. 4) elongate, with anterior stalk, posteriorly considerably produced but rounded; genitalia (figs. 5–6) with a narrow ring-like gonocardo, gonosquama more or less separate from gonostipes, with two or three distal bristles and some more proximal ones, volsella consisting of two lobes, a small dorsal one lying on top of posterior part of larger one which is anteriorly not sharply marked off from gonostipes, parameres narrow, distally rounded.

Specimens examined :—B.W.I., TRINIDAD : St. Augustine, *ex* Embiid,

type ♀ and allotype ♂, 8 ♂♂ paratypes 25.iii.1938 (*E. McC. Callan*), same date, 10 ♀♀ paratypes 28.iii.1938 (*E. McC. Callan*); MEXICO: Vera Cruz, Cordoba, ♂ paratype 25.iv.1908 (*Dr. A. Fenyès*) (U.S. Nat. Mus.).

Of the Trinidad specimens the type and allotype will be deposited in the British Museum and paratypes will be deposited there, in the U.S. Nat. Mus., in the Deutsches entom. Institut, in the Mus. civ. Stor. Nat., Genova, and in my collection.

In the females the antennal segment-numbers were:—4 23, 1 23 left 22 right, 2 22, 2 20, 2 broken; in the male:—1 25, 4 23 (including ♂ Mexico), 3 22, 2 20.

The cocoon of one Trinidad specimen (♀) is white, semitransparent, cigar-shaped,  $4.5 \times 1.0$  mm.; the adult emerged by an irregular hole at one end. I understand that Mr. Callan hopes to obtain more specimens so that the host may be identified.

### *Probethylus mexicanus* sp. n.

Male. Black; proximal part of antennae, mouthparts and legs brown, tarsi paler. Tegulae brown. Wings hyaline, venation very pale. Whole surface covered with very fine, moderately close, semi-erect, greyish pubescence. Length 2.0 mm.

Structurally similar to *P. callani* sp. n. but differing as follows:—Head considerably more shining with sparser but very fine punctures, area between eyes quadrate, POL: OOL = 2:3, eyes rather more separated from mandibles and separated by at least two ocellar diameters from occiput; antennae with 25 segments (broken in paratype); mesonotum and scutellum more shining, more sparsely and rather more strongly punctured, notaulices incomplete for their posterior fifth; propodeum much more finely sculptured, largely smooth and shining, with sparse, irregular rugosities; mesopleuron more shining, unpunctured postero-ventrally; wings (fig. 11) similar but second radial cell a little more elongate even than in Mexican specimen of *P. callani* sp. n., Rs considerably more bent forwards distally; genitalia (fig. 12) with gonosquama and gonostipes fused, bearing a continuous series of about twelve bristles, dorsal lobe of volsella larger and better defined, ventral lobe with about eighteen bristles.

Specimens examined:—type and paratype MEXICO: Vera Cruz, Cordoba, ♂♂ 25.iv.1908 (*Dr. A. Fenyès*) (U.S. Nat. Mus.). Paratype now in the collection of the British Museum.

### *Sclerogibba* Riggio and T. Stefani-Perez, 1888.

Female. Similar to *Probethylus* Ashmead (described above) except in the following characters:—Ocelli in a broad-based triangle, posterior ones much further from one another than from median one, often much nearer to eyes than to one another; mandibles with two distal teeth, maxillary palpi with five segments, labial with three (these characters are somewhat doubtful since no specimen was dissected); metanotum more or less visible at each side of scutellum posteriorly; mid tibiae with two spurs.

Male (chiefly from the description of Masi, 1933). Similar to *Probethylus* (described below) but differing as follows:—Eyes more widely separated from occiput, by more than one-third their length (or at least three or four ocellar diameters); second radial ("marginal") cell shorter, its costal margin shorter than or as long as sector of media which forms posterior margin of first radial ("cubital") cell; vein cul extending some distance beyond mcu; sometimes part of M 3 + 4 present with *iml* enclosing a cell (venation according to Bradley's notation).

Type (monobasic) = *Sclerogibba crassifemorata* Riggio and T. Stefani-Perez, 1888 ♀ = ? *Cryptobethylus mancinii* Masi, 1933 ♂.

Synonyms. *Tanynotus* Cameron, 1904 syn. n. Type (monobasic) = *T. rufithorax* Cameron, 1904; *Myistrocnemis* Kieffer, 1905a syn. n. Type (monobasic) = *M. erythrothorax* Kieffer, 1905a; *Prosclerogibba* Kieffer, 1905 syn. n. Type (only species placed in genus when species first cited) = *P. magretti* Kieffer, 1913; *Cryptobethylus* Marshall in Kieffer and Marshall, 1905 syn. n. Type (only species placed in genus when species first cited) = *C. mancinii* Masi, 1933; *Lithobiocerus* Bridwell, 1919 syn. n. Type (monobasic) = *L. vagabundus* Bridwell, 1919.

Owing to the very strong sexual dimorphism in the group and to the very imperfect descriptions published by Kieffer, the above synonymy needs some explanation.

The type ♀ of *Sclerogibba crassifemorata* Rig. and Stef.-Perez is destroyed (information received from Dott. D. Guiglia). The original description has been supplemented by Kieffer (1905 : 257, pl. 16, figs. 1, 2, 6, 7) and (1914 : 563, figs. 202-204). Kieffer's remarks are in part contradictory. In his descriptions, he states that the fore tibia is strongly thickened but in his key (1914 : 560) he partly separates it and *Prosclerogibba* from *Myistrocnemis* because the tibiae are not thickened. As the fore tibia of *Prosclerogibba* is certainly thickened, I feel sure that that of *Sclerogibba* is also. This is supported by the original description (1888). Kieffer states that the ocelli are absent; as they are difficult to see in this group and as they are present in *Prosclerogibba* in which Kieffer also states that they are absent, I assume that they are present in *Sclerogibba*. Kieffer describes a difference in the claws of *Sclerogibba* and *Myistrocnemis*; I suspect that he was really comparing the front claws of the first with the hind ones of the second. Their structure is not easy to make out in this group and I propose to ignore this character until more material is available. Finally, Kieffer probably overlooked the small mesonotum and misnamed the scutellum; his figure of the thorax is unconvincing and very different from that of Riggio and Stefani-Perez.

*Tanynotus* Cameron was described as having about 40 antennal segments and no ocelli. Actually, the type has 25 antennal segments and the ocelli are present.

*Myistrocnemis* was published by Kieffer (1905a) for one species, *M. erythrothorax* Kieffer, 1905a; the ♀ type of this should be in the Mus. civ. Genova but Dott. Guiglia tells me that it cannot now be traced. In 1905b (for dates of publication see note p. 223), Kieffer published a second species, *M. africana* and refers to, without describing, a second species, *M. asiatica*. The latter name is a *nomen nudum* which is almost certainly a synonym of *M. erythrothorax* Kieff.

I have examined the type of *Prosclerogibba magretti* Kieffer, 1913 and I do not think that it shows any fundamental differences from species of *Sclerogibba*. The somewhat better developed mesothorax is perhaps associated with its larger size.

Kieffer (1905 : 259, pl. 2, fig. 12) published a genus *Cryptobethylus* from T. A. Marshall's manuscript. I suspect that the figure of the wing-venation is not altogether accurate, particularly as regards the second radial ("marginal") cell. As no species were originally included in *Cryptobethylus*, the one described by Masi (1933), *C. mancinii*, becomes the type. It is highly probable that this is the unknown male of *S. crassifemorata* Rig. and Stef. Dr. Masi considered the differences too great for this to be probable, but Mr. Callan's series, showing the same sort of dimorphism in an allied genus, supports my view.

*Lithobiocerus* Bridwell, 1919 was described from a single female captured in Hawaii, Honolulu. Dr. C. F. W. Muesebeck tells me that it is now preserved (in very bad condition) in the U.S. National Museum.

Bridwell states that the female has one mid tibial spur but Dr. Muesebeck tells me that there are really two. The labial palpi are stated to have six segments. This is clearly a misprint for the maxillary palpi and I feel that these require re-examination (the type is now headless). Bridwell also describes a constriction in the mesonotum. I think that, like Kieffer, he is really referring to the scutellum; probably the structure was quite typical of the group but he was misled by Kieffer's inaccurate figure. Dr. Muesebeck is of the opinion that *Lithobiocerus* is clearly a synonym of *Sclerogibba*.

*S. crassifemorata* Riggio and T. Stefani-Perez, 1888 ♀.

? *Cryptobethylus mancinii* Masi, 1933 ♂.

The unique ♀ type was found in Italy, Island of Ustica, Falconiera. It is now destroyed. The type of *C. mancinii*, fully described by Masi, was captured in Italy, Island of Capraia. It is rather unlikely that there are two species of this genus in Italy, so that the ♂ and ♀ may be provisionally associated.

*S. africana* (Kieffer, 1905b).

*Mystrocnemis africana* Kieffer, 1905b.

Female. Head dorsally black except for the prominence on which antennae are inserted; clypeus brownish; antennal prominence, antennae, thorax, propodeum and legs reddish-yellow; mouthparts whitish-yellow; abdomen brownish-black, posterior margins of segments somewhat paler; head with short, moderately close, backwardly directed, pale pubescence; rest of body with short, appressed, pale pubescence. Length 4.0 mm.

Resembles *Probethylus callani* sp. n. (above) except in following particulars:—Head (fig. 13) in dorsal view longer, but not quite so long as in *S. embiidarum* (Kieff.), one-quarter longer than greatest width across eyes; ocelli smaller, ocellar triangle with posterior side half as long again as other two, posterior ocelli on occiput, POL:OOL = 2.5:1; eyes in dorsal view less than half as wide as distance between them, separated from occipital margin posteriorly by no more than an ocellar diameter; antennae with 26 segments, 1 thicker, hardly twice as long as broad, 2 transverse, 3–13 just transverse, 14–25 about quadrate, 26 a little longer; mandibles probably with two distal teeth; maxillary palpi probably with five segments (four visible), labial palpi invisible; pronotum a little longer (not so long as *S. embiidarum* (Kieff.)), hardly broader anteriorly than posteriorly, a little more than twice as long as broad; traces of metanotum evident laterally; propodeum about as in *M. embiidarum* (Kieff.) but with distinct central, longitudinal impression; fore tarsi apparently with peg-like structures; mid tibiae with two equal, moderately long spurs.

Specimens examined:—Type PORTUGUESE GUINEA: Bolama, ♀ vi-xii.1899 (*L. Fea*) (Mus. civ. Stor. nat. Genova).

*Sclerogibba rufithorax* (Cameron, 1904).

*Tanymotus rufithorax* Cameron, 1904.

? *Mystrocnemis capensis* Brues, 1906.

Female. Coloured as in *Probethylus callani* sp. n. (above) but pale parts redder. Length 4.0 mm.

Structurally resembles *P. callani* sp. n. except in following particulars:—Head in dorsal view a little longer (about as in *S. magretti* (Kieff.)); median ocellus very small, posterior

side of ocellar triangle about one and a half times as long as other two, posterior ocelli on occiput, POL: OOL = 5:4; eyes separated from occipital margin posteriorly by one and a half ocellar diameters, from antennal sockets by three-quarters length of antennal segment 1, from mandibles by half width of same segment; antennae with 25 segments; tip of mandibles and labial palpi invisible, maxillary palpi probably with five segments (four visible); pronotum a little longer, more parallel-sided, two and a half times as long as broad, with an impressed central line; mesonotum very small, with weak longitudinal furrows; scutellum of same general shape but about as long as broad; metanotum just visible laterally; propodeum with faint traces of central impression anteriorly, considerably longer, sides almost parallel, hardly diverging posteriorly; fore tarsi with pegs apparently similar in arrangement; mid coxae with dorsal keel much less strong; mid tibiae with some very short, black spines on dorsal surface, with two equal, moderately long spurs.

Specimens examined:—Type, CAPE COLONY: Dunbrody, ♀ (*I. A. O'Neil*) (Brit. Mus.).

Brues (1906) described a *Mystrocnemis capensis* from Natal, Sundays River. The description agrees well with *S. rufithorax* (Cam.) of which it may well be a synonym; the type should be in the Milwaukee Public Museum.

*Sclerogibba embiidarum* (Kieffer, 1925).

*Mystrocnemis embiidarum* Kieffer, 1925.

Female. Pale parts of head and thorax more yellowish in type (perhaps because of original preservation in alcohol), not in other specimens; head with posterior two-thirds dorsally black, rest of head, antennae, thorax, propodeum and legs pale; abdomen blackish-brown, posterior quarter of tergites 2–5 testaceous. Length 3.3–4.5 mm.

Structurally resembles *P. callani* sp. n. (above) except in following particulars:—Head in dorsal view long-pyriform, one-third longer than greatest width of head across eyes, with traces of sparse fine punctures on top of alutaceous sculpture; ocelli smaller, especially median one, ocellar triangle with posterior side half as long again as other two, posterior ones almost on occiput, POL: OOL = 2.5:1; eyes in dorsal view rather less than half as wide as distance between them, separated from occipital margin posteriorly by an ocellar diameter; antennae with 24–27 segments (24 in type, 26 and 27 in two other specimens, one more with broken antennae), 1 more pyriform, 2 very short, 3–13 transverse, 14–24 (25–26) quadrate, last segment about twice as long as broad; mandibles apparently with two distal teeth; maxillary palpi with four segments visible and therefore probably with five in all, labial palpi with two long segments visible, probably with three in all; pronotum longer, hardly at all broadened anteriorly, two and a half times as long as broad; scutellum relatively longer, more contracted anteriorly; traces of metanotum evident laterally; propodeum longer, at least one and a half times as long as broad, broadest behind middle, sides straight, disc with trace of central impressed line; fore tarsi with rather similar arrangement of pegs but these are in transverse rows of three on most of basitarsus and there are three on segment 2 and two on 3; mid tibia with two equal spurs of moderate length; abdomen relatively a little longer.

Specimens examined:—Type, CEYLON: Colombo, bred *Oligotoma greeniana* End., ♀ ix.1924 (*K. Friedrichs*) (Deutsches ent. Inst.); INDIA: Madras, Mangalore, 3 ♀♀ vi.1926 (*J. C. Bridwell*) (U.S. Nat. Mus.).

*Sclerogibba erythrothorax* (Kieffer, 1905b).

*Mystrocnemis erythrothorax* Kieffer, 1905b.

? *M. asiatica* Kieffer, 1905a (*nomen nudum*).

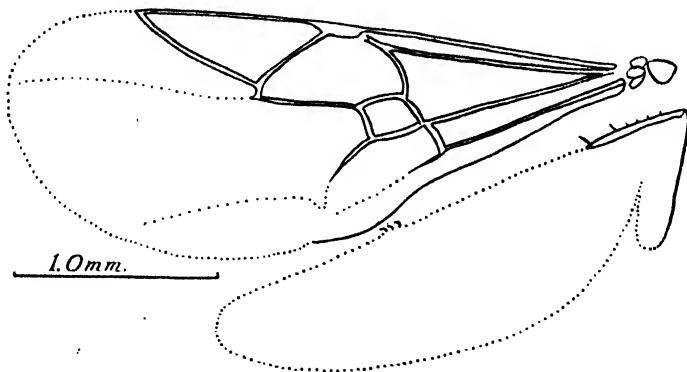
As stated above (p. 217) the type of this species cannot now be traced; there is nothing in the description to differentiate it from *S. embiidarum* (Kieff.).

*Sclerogibba magretti* (Kieffer, 1913).

*Prosclerogibba magretti* Kieffer, 1913.

Female. Black, anterior third of dorsal part of head, antennae, mouthparts, thorax, propodeum and legs reddish-testaceous; central part of antennae a little darker; abdomen brownish-black, posterior margin of tergites hardly lighter. Head, thorax, propodeum and legs with semi-erect, reddish pubescence which is longer and denser on head; abdomen with very short, appressed, greyish pubescence. Length 5.0 mm.

Structurally similar to *Probethylus callani* sp. n. except in following particulars:—Head with sparse, fine punctures on top of alutaceous sculpture, area between eyes somewhat more raised above them anteriorly, ocellar triangle with posterior side fully one and a half times as long as other two sides, POL: OOL = 1, posterior ocelli on the occipital margin, eyes in dorsal view hardly more than one-quarter as broad as distance between them, separated from occiput by three ocellar diameters, separated from antennal socket by about length of antennal segment 1; antennae with 29 segments, 1 hardly twice as long as broad, with very large proximo-ventral flange, 2 very short and transverse, 3 quadrate, 4–22 just transverse, 23–28 quadrate, 29 a little longer; mandibles apparently with two distal teeth; maxillary palpi probably with five segments (four visible), labial palpi not visible; mesonotum relatively longer, less than twice as broad as long, with traces of longitudinal furrows; scutellum a little broader than long; traces of metanotum visible laterally; propodeum relatively longer, sides at first straight and divergent, then more strongly convergent, with strong, weakly punctured, central impression; fore tarsi with no peg-like structures visible in unprepared specimens; mid tibiae with two equal, moderately long spurs.



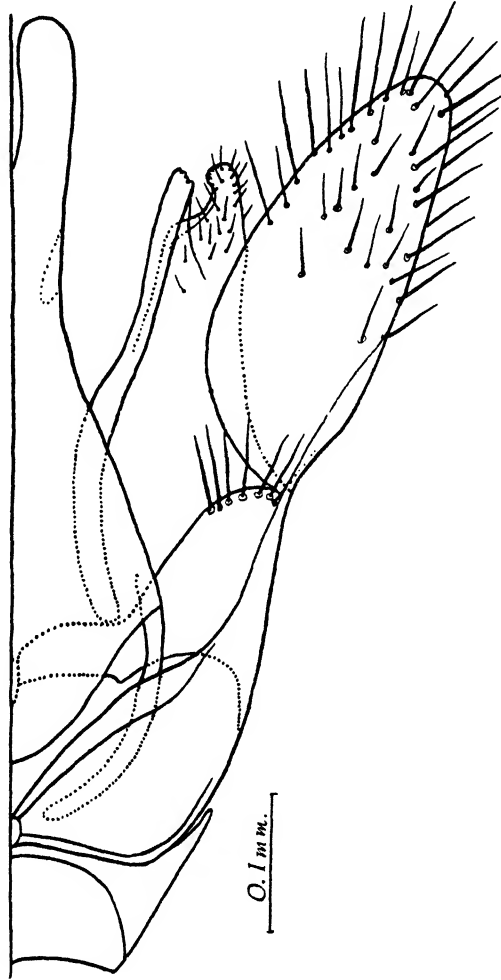
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FIG. 16.—Wings of *S. turneri* sp. n., ♂.

Specimen examined:—Type N. AFRICA: Eritrea, ♀ 1900 (*P. Magretti*) (Mus. civ. Genova).

After the type of *S. magretti* (Kieff.) had been returned, a second specimen of the species was found amongst the collection made by the British Museum Expedition to S.W. Arabia, 1938. This female differs from the type as follows:—

Head reddish, posterior half hardly perceptibly darkened; anterior half of propodeum, mid and hind femora and tibiae mainly dark brown; length 4.5 mm.; antennae broken, with 27 + segments; scutellum a little more elongate, outline oval, about as long as broad.



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FIG. 17.—Left half ♂ genitalia, dorsal, same species.

YEMEN : Beit Baus, about 5 miles S. of San'a, ca. 7900 ft., 28.i.1938 (*H. Scott and E. B. Britton*).

*S. vagabunda* (Bridwell, 1919).

*Lithobiocerus vagabundus* Bridwell, 1919.

Closely allied to (perhaps the same as) *S. embiidarum* (Kieff.). One female from Hawaii (see p. 218).



*S. turneri* sp. n.

Male. Black; antennae and legs browner, tibial spurs whitish. Wings hyaline, venation dark brown. Whole surface with moderately close, semi-erect, short, greyish pubescence. Length 2.5–3.0 mm.

Structurally resembles *Probethylus callani* sp. n. except:—punctures of head rather more distinct, but very fine and close, central anterior impression usually a shallow furrow rather than a circular pit, area between eyes more nearly square, posterior side of ocellar triangle somewhat longer than the other two, POL: OOL = 5:4, posterior ocelli separated by four times their diameter from occiput; eyes in dorsal view only one-quarter as wide as distance between them, separated from mandibles by one-third or less diameter of segment 1 of antennae, from occiput (in side view) by three or four ocellar diameters; antennae with 25–30 segments; mandibles curved, with three distal teeth, the central one very small; labrum in dissected specimen a narrowly triangular, little sclerotised plate bearing two distal bristles; maxillary palpi with probably six segments, 1–2 moderately long, about two and a half times as long as broad, 3 much thicker, oval, hardly twice as long as broad, 4 long and narrow, as long as 1 + 2, 5 two-thirds as long as 4, end of 5 broken in single specimen dissected but it probably bore a sixth segment; labial palpi with three segments all of about same moderate length. Pronotum with more or less distinct traces of central impressed line, anterior corners less angulate, lateral aspect duller; propodeum dull, coarsely shagreened with traces of a weak raised network of keels and a complete rather strong central keel. Wings as in fig. 16, hind-wing with two straight proximal and three curved distal hamuli. Abdomen with sternite 9 (morphological ninth) as in *P. callani* sp. n. but anterior part of plate somewhat more parallel-sided; genitalia fig. 17.

Specimens examined:—S. Africa, East Cape Province, Katberg, 4000 ft., 90 ♂, 1 ex. xii.1932, 2 ex. 1–15.i.1933, 2 ex. 15–30.i.1933, 2 ex. (including type) 1–10.ii.1933, 2 ex. 19–26.ii.1933 (*R. E. Turner*) (B.M.).

The number of antennal segments in these specimens (in the above order) was:—27, 27, 30, 25, 29, 26, 29, 28, broken.

There is little doubt that this species with its more complete venation and somewhat different genitalia will eventually be placed in some genus other than *Sclerogibba*. Until the female is known and particularly till it is shown whether *Tanymotus rufithorax* Cameron is or is not the female, I think it is best left in *Sclerogibba*.

## Key to the recognisable species.

♀♀.

1. Mid tibia with two spurs . . . . . 2.
- . Mid tibia with one spur. (POL: OOL = 1). . . . . *Probethylus callani* sp. n.
2. Prothorax anteriorly and femora mainly dark brown . . . . .  
*Sclerogibba crassifemorata* Rig. and T. Stef.
- . Prothorax entirely reddish . . . . . 3.
3. Pronotum with an impressed central line. Mid tibia with minute black spines. (POL: OOL = 5:4) . . . . . *S. rufithorax* (Cam.).
- . Pronotum without an impressed line. Mid tibia only pubescent . . . . . 4.
4. Propodeum with a central impressed line. Scutellar margins parallel . . . . . 5.
- . Propodeum with no distinct impressed line. Scutellar margins anteriorly approximated. (POL: OOL = 2.5:1) . . . . . *S. embiidarum* (Kieff.).
5. Larger; scutellum broader than long; mesonotal furrows distinct; POL: OOL = 1:1 . . . . . *S. magretti* (Kieff.).
- . Smaller; scutellum about quadrate; mesonotal furrows not distinct; POL: OOL = 2.5:1 . . . . . *S. africana* (Kieff.).

## ♂♂.

1. Cross vein *iml* present in fore-wing, so that there is a closed intermedian cell.  
Eyes separated by 3-4 ocellar diameters from occiput . . . . . *S. turneri* sp. n.
- This cross vein absent . . . . . 2.
2. Eyes separated by one-third their length from occiput  
*S. crassifemorata* Rig. and T. Stef.
- Eyes not separated by more than two ocellar diameters from occiput . . . . . 3.
3. Head and mesonotum more shagreened, less punctured, duller. Notaulices complete . . . . . *P. callani* sp. n.
- Head and mesonotum shining, finely punctured. Notaulices incomplete . . . . . 4.
4. Notaulices extremely weak, not punctate, not extending half-way across mesonotum . . . . . *P. schwarzii* Ashmd.
- Notaulices stronger, punctate, extending four-fifths of the way across mesonotum . . . . . *P. mexicanus* sp. n.

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# A NOTE ON THE BREEDING OF *PROBETHYLUS CALLANI* RICHARDS (HYMENOPT., BETHYLIDAE), AN EMBIOPTERAN PARASITE

By E. MCC. CALLAN, B.Sc., A.R.C.S., Ph.D., F.R.E.S.

EMBIOPTERA appear to be widespread in Trinidad, B.W.I., and are not infrequently encountered living in colonies beneath their silken webs on the trunks of trees in virgin and secondary forest and in cacao and grapefruit plantations. They seem to be rather more abundant in the dry season which extends from January to April. In 1938 some twenty complete colonies with their webs

<sup>1</sup> 1905a was received at the British Museum (Natural History) library on 7.ii.1905. 1905b (although the volume is for 1904) was received at the above library on 5.v.1905 and at the library of the Royal Ent. Soc. Lond. on 3.v.1905. I think there is no doubt that 1905a was published before 1905b. I am indebted to Mr. F. J. Griffin for these facts.

were removed from trees and kept alive in petri dishes, and numerous others were observed in the field but not collected.

*P. callani* was bred from only one of these colonies found on the trunk of a grapefruit tree in a garden in St. Augustine on 25.iii.1938. This colony when collected consisted of a few adult males and females and numerous nymphs of various stages, and was kept alive in a large petri dish for about six weeks. A number of nymphs eventually became adults, but others were observed to be parasitised. The parasitic larvae were ectophagous and bright yellow in colour. They invariably occupied a transverse position on the dorsal surface of the thorax of the host, being attached usually between the head and prothorax or between the pro- and mesothoracic segments. Up to the time when the larvae were about half-grown, they appeared to have little effect on the parasitised nymphs, which were fully as active as those unparasitised. Later the nymphs became sluggish until finally killed by the parasite. The larvae continued to feed upon their dead hosts until the body contents were consumed, and pupated near the host remains within a tough cocoon. Cocoons were rendered somewhat inconspicuous in the tunnels of the web due to adhering Embiopteran excretal pellets. On emergence both sexes of *P. callani* were very active, the winged males flying from the web while the wingless females remained within its tunnels.

It was hoped to make more detailed observations on this parasite, but repeated search yielded no further specimens, and it would appear that it is of some rarity.

## SOME NOTES ON THE NOMENCLATURE OF THE STAPHYLINIDAE (COLEOPTERA)

### Part 1.

By Rev. C. Edward TOTTENHAM, M.A., F.R.E.S.

DURING the course of the preparation of a paper on the generic names of British STAPHYLINIDAE undertaken at the request of the Committee for Generic Nomenclature of the Royal Entomological Society of London, three facts soon became obvious. Firstly, a number of genera were found for which no citation of genotype could be traced. Although some of these had, rightly or wrongly, been sunk as synonyms, yet it was necessary that they should have types fixed in order to stabilise the synonymy, or to show whether, and in what sense, the names would be available, should it be necessary to divide a genus. Secondly, many generic and subgeneric names have come to be used in a sense other than that which is consistent with the first type fixation. The correction of these errors has resulted in a number of genera or subgenera each requiring a new name. Thirdly, by noting the generic name under which each species was described, a number of homonyms have been detected.

It is the purpose of this paper to fix types for all the genera containing British species for which no genotype has been traced and to supply new names for genera and species where they are required. Since in my subsequent paper I omit synonyms which have never been applied to British species, I include here those few which are at present without type-citations. I have also included a few necessary changes in nomenclature of species of the genus *Philonthus*, where preoccupied names have been detected during studies on this genus.

## I. New Generic Names.

**Abinothum** nom. n. and **Onibathum** nom. n.

The name *Eusphalerum* Kraatz, 1857 (*Nat. Ins. Deutsch. Col.* 2 : 1003), must be used for the genus *Anthobium* Erichson & Auct. (*nec* Samouelle) since *melanocephalum* Marsham, 1802, the type of Samouelle's genus, belongs in the genus *Lathrimaemum* Erichson.

Whereas Kraatz only placed one species in *Eusphalerum* and retained the other species in *Anthobium*, Ganglbauer (1895) placed some of the species which Kraatz kept in *Anthobium* in *Eusphalerum*. The two genera of these two authors, therefore, did not coincide entirely. This is apt to lead to confusion if it is desired to divide the genus, especially as the name *Anthobium* cannot be used. I propose the following arrangement :—

Subgenus *Eusphalerum* s.str. (= *Eusphalerum sensu* Kraatz = *Eusphalerum pars sensu* Ganglbauer).

Type (genus monobasic) = *Omalium primulae* Stephens, 1834.

Subgenus **Abinothum** nom. n. (= *Anthobium pars sensu* Kraatz = *Anthobium sensu* Ganglbauer).

Type (here fixed) = *Anthobium longipenne* Erichson, 1839.

Subgenus **Onibathum** nom. n. (= *Anthobium pars sensu* Kraatz = *Eusphalerum pars sensu* Ganglbauer).

Type (here fixed) = *Silpha minuta* Fabricius, 1792.

**Craetopycerus** nom. n.

Thomson, 1859 (*Skand. Coleopt.* 1 : 43) divided Mannerheim's genus *Platystethus* into two genera, *Platystethus* and *Pycotocraerus*; but since he made *Staphylinus morsitans*, which is the type of *Platystethus* (fixed by Westwood, 1838), the type of his *Pycotocraerus*, this genus becomes synonymous with Mannerheim's genus. I propose the name *Craetopycerus* for Thomson's *Platystethus*, for which he cited *Oxytelus cornutus* Gravenhorst, 1802, as the type.

**Cotysops** nom. n.

For the genus *Hesperophilus* Stephens, 1829 (*Nomencl. Brit. Ins.* : 24) Westwood in 1838 cited as type the species *Staphylinus fracticornis* Paykull, 1790. Thomson's citation of *Staphylinus arenarius* Paykull, 1790, is therefore invalid. His use of the name cannot be maintained either. A new name is required for *Hesperophilus sensu* Thomson *nec* Stephens, and I propose the name *Cotysops*, the species cited by Thomson becoming the genotype.

**Thiphonilus** nom. n.

The genus *Thinophilus* Mulsant & Rey, 1878 (*Ann. Soc. Agric. Lyon* (4) 10 : 764) has as yet no type fixed : furthermore the name is preoccupied in use by Wahlberg, 1844 (Diptera). In its place I propose the name *Thiphonilus*, and cite *Thinobius linearis* Kraatz, 1859, as the type.

**Alapsodus** nom. n.

The name *Anodus* Nordmann, 1837, is a homonym, having been used by Spix, 1829 (Pisces). In its place I propose the name *Alapsodus*, and cite *Anodus falcifer* Nordmann, 1837, as the type of the genus.

**Bobitobus** nom. n.

Samouelle's genus *Bolitobius* was monobasic, with *Staphylinus analis* Paykull, 1789, as the type (1819, *Ent. Comp.* : 176). The type-citations there-

fore of Westwood and Thomson, who cited *Staphylinus lunulatus* Linnaeus, 1761, are invalid, and the name cannot be used for this species and its allies, as has been done by Thomson and subsequent authors. I propose in its place the name *Bobitobus*, the type still being *Staphylinus lunulatus* Linnaeus.

It must be noted that Thomson in spelling the name "*Boletobius*" was not creating a new name, for he attributes it to Leach, to whom also Samouelle attributed *Bolitobius*, and also subsequently himself spells it correctly. The two spellings must therefore be regarded as synonymous.

#### **Schinomosa** nom. n.

Since Thomson (1859, *Skand. Coleopt.* 1 : 47) made *Tachinus splendidus* Gravenhorst, 1806, the type of his genus *Ischnosoma*, and Westwood had already (1838) fixed this species as the type of *Mycetoporus* Mannerheim, 1831, these two genera are synonymous. Furthermore Thomson's citation of *Tachyporus punctus* Gyllenhal, 1810, as type of *Mycetoporus* is invalid, and a new name is required for the genus of that name as limited by him. I propose the name *Schinomosa*, *Tachyporus punctus* Gyllenhal remaining the type.

#### **Pischnopoda** nom. n.

Since Westwood fixed the type of *Ischnopoda* Stephens, 1835, as *Aleochara atra* Gravenhorst, 1806 (= *Aleochara aterrima* Stephens, 1832, nec Gravenhorst, 1802), the name cannot be applied to the section of *Tachyusa* Erichson, which has *Staphylinus leucopus* Marsham, 1802, as type, namely the section *Ischnopoda* Thomson, 1859. For this I propose the name *Pischnopoda* with the same type.

#### **Lepla** nom. n.

Since Duponchel (1841) fixed the type of *Myrmedonia* Erichson as *Staphylinus canaliculatus* Fabricius, 1787, this generic name cannot be used *sensu* Mulsant & Rey (1874, *Ann. Soc. Agric. Lyon* (4) 6 : 82) for a section of *Zyras* Stephens. I propose for this section the name *Lepla* with *Aleochara lugens* Gravenhorst, 1802, as the genotype.

#### **Lomechusoides** nom. n.

The type of *Lomechusa* Gravenhorst, 1806, having been fixed by Latreille (1810) as *Staphylinus emarginatus* Paykull, 1789, the name cannot be used for *Staphylinus strumosus* Fabricius, 1775, as has been done by most authors. I propose in its place the name *Lomechusoides*, *Staphylinus strumosus* Fabricius being the type.

A full discussion of the confusion with regard to the generic names *Lomechusa*, *Atemeles* and *Dinarda* will appear in my paper on the generic names of the British STAPHYLINIDAE in the *Generic Names of British Insects*.

#### **Sedomoma** nom. n.

Thomson (1859, *Skand. Coleopt.* 1 : 37) formed two genera *Bessobia* and *Demosoma*. He fixed as type for these the species *Oxypoda testacea* Erichson, 1837, and *Oxypoda formiceticola* Märkel, 1841, respectively. These two species being considered now to be congeneric, the two genera become synonymous. *Demosoma*, therefore, cannot be used in the sense in which it is used in the *Coleopt. Cat.* for *Oxypoda soror* Thomson, 1855, and its allies, and Fenyès's fixation of this species is invalid. For this group I propose the name *Sedomoma*, with *Oxypoda soror* Thomson as the genotype.

# SOME NOTES ON THE NOMENCLATURE OF THE STAPHYLINIDAE (COLEOPTERA)

## Part 2.

By Rev. C. Edward TOTTENHAM, M.A., F.R.E.S.

### II. Remarks on Some Generic Names and Type-citations.

*Phloeobium* Lacordaire in Boisduval & Lacordaire, 1835 (*Fn. Ent. Paris* 1 : 492).

Of the five species placed by Lacordaire in this genus, four are in the genus *Megarthrus* Stephens : since the type of the present genus has never been fixed, it is necessary to fix a type. I propose *Silpha clypeata* Müller, 1821 (= *Phloeobium corticale* Lacordaire). This fixation is in accord with current usage.

*Xylodromus* Heer, 1839 (*Fn. Helv.* 1 : 174).

Thomson's type citation of *Omalium monilicorne* Gyllenhal cannot stand, since this species was not originally included in the genus. I propose for the type *Omalium depressum* Gravenhorst 1802 (= *Xylodromus deplanatus* Gyllenhal, 1810).

I also propose the same species as the type of Fiori's genus *Drephophylla*, 1900 (*Atti Soc. Nat. Modena* (4) 1 : 90), which is regarded as synonymous with Heer's genus.

*Carpalimus* Samouelle, 1819 (*Ent. Comp.* : 174) (= *Trogophloeus* Mannerheim, 1831).

Several subgeneric divisions of this genus are at present without fixed types. I propose types as follows :

*Boopinus* Klima, 1904, *Münch. kol. Z.* 2 : 56.

Type = *Trogophloeus memnonius* Erichson, 1840.

*Trogolinus* Sharp, 1900, *Ent. mon. Mag.* 36 : 231.

Type = *Trogophloeus unicolor* Sharp, 1900.

*Troginus* Mulsant & Rey, 1878, *Ann. Soc. Agric. Lyon* (4) 10 : 758.

Type = *Trogophloeus exiguus* Erichson, 1839.

The correct usage of these and other subgeneric names will appear in my paper on the generic names of the British STAPHYLINIDAE.

*Neobisnius* Ganglbauer, 1895 (*Käf. Mitt. Eur.* 2 : 464) and *Erichsonius* Fauvel, 1874 (*Bull. Soc. Linn. Norm.* (2) 8 : 201).

The species of these two genera were first separated by Thomson, who placed some in his genus *Bisnius* (preoccupied by *Bisnius* Stephens 1829) and the others in the genus *Remus* Holm which he understood wrongly (spelling it in error *Rembus*).

Fauvel combined the two genera in one, at the same time correcting Thomson's mistakes by creating the genus *Erichsonius*. Subsequently (1876, *Bull. Soc. Linn. Norm.* (2) 10 : 257) he quite unnecessarily gave his genus the new name *Actobius*, thinking *Erichsonius* to be preoccupied by *Erichsonia* Westwood, 1849.

Ganglbauer again separated the species into two genera as Thomson had

done, giving the new name *Neobisnius* to Thomson's *Bisnius*. The type of Thomson's *Bisnius* (a monobasic genus) becomes the type of *Neobisnius* Ganglbauer.

The name *Actobius* has to be abandoned since Fauvel used it as a synonym for the earlier name *Erichsonius*. The type of *Erichsonius* (and *Actobius*) has never been fixed. I cite as type for this genus (and for *Actobius*) the species first placed by Thomson in his *Remus*, namely *Staphylinus cinerascens* Gravenhorst, 1802, thereby enabling the generic name *Neobisnius* to stand, and preventing two changes in generic names.

(Note.—Whilst this paper was passing through the press my attention was directed to a paper by Blackwelder (1939, *Proc. U.S. nat. Mus.* 87 : 93–125), where the genera and subgenera of the Paederini are revised. Types are designated for all genera and subgenera for certain of which I had proposed to designate types, usually the same species as that designated by Blackwelder.)

I take this opportunity of adding the following change of name, the need for which I discovered too late for inclusion in Part 1 of this paper.

#### *Pellolurga* nom. n.

Mulsant and Rey (1874 (1873), *Ann. Soc. Agric. Lyon* (4) 6 : 609) proposed the name *Pelurga* for a monobasic genus, unaware of the fact that it was a homonym of *Pelurga* Hübner [1825]. I propose the name *Peliolurga* to replace it. Type (genus monobasic) = *Bolitochara luridipennis* Mannerheim, 1831.

*Mecorhopalus* Solier, 1849, in Gay, *Hist. Chile* (Zool.) 4 : 347.

Fenyès cited *Staphylinus curtulus* Goeze, 1777, as the type of this genus; but his citation is invalid since the species was not originally included by Solier in the genus. I cite as type *Mecorhopalus ater* Solier, 1849.

*Sipalia* Mulsant & Rey, 1853 (*Ann. Soc. Linn. Lyon* 1 : 32).

Fenyès cited *Leptusa pandellei* Brisout, 1867, as the type of this genus; but this citation is invalid since the species was not originally included in the genus by the authors. I cite *Aleochara circellaris* Gravenhorst, 1806.

### III. Some Citations of Type for Genera where no Type-citation has been traced.

In the following lines I designate genotypes for those generic names for which I can discover no genotype.

*Ancyrophorus* Kraatz, 1857 (*Naturg. Ins. Deutschl. Coleopt.* 2 : 895).

Type = *Trogophloeus omalinus* Erichson, 1840.

*Bargus* Schiødte, 1866 (*Naturh. Tidsskr.* (3) 4 : 148).

Type = *Staphylinus fracticornis* Paykull, 1790. (See p. 229.)

*Blediodes* Mulsant & Rey, 1878 (*Ann. Soc. Agric. Lyon* (4) 10 : 555, 576).

Type = *Staphylinus fracticornis* Paykull, 1790. (See p. 229.)

*Bryophacis* Reitter, 1909 (*Fn. Germ.* 2 : 102).

Type = *Bolitobius rufus* Erichson, 1839.

*Compsochilus* Kraatz, 1857 (*Nat. Ins. Deutschl. Coleopt.* 2 : 895).

Type = *Acrognathus palpalis* Erichson, 1839.

*Dropephylla* Mulsant & Rey, 1880 (*Ann. Soc. Linn. Lyon* 27 : 242).

Type = *Omalium iopterum* Stephens, 1834 (= *Omalium lucidum* Erichson, 1839).

*Ediquus* Mulsant & Rey, 1875 (*Ann. Soc. Agric. Lyon* (4) 8 : 616).

Type = *Quedius microps* Gravenhorst, 1847.

*Ellipsotomus* Motschulsky, 1857 (*Etud. Ent.* 6 : 53).

Type = *Staphylinus marginellus* Fabricius, 1781.

(*Elliptoma* Motschulsky [1844] *Bull. Soc. Nat. Moscou* 18 (1) : 41. This is an earlier spelling, but no species were included.)

*Hemistenus* Motschulsky, 1860 (*Bull. Soc. Nat. Moscou* 33 (1) : 557 (pars)).

Type = *Stenus palliarsis* Stephens, 1833.

*Homalotrichus* Solier, 1849 (*in Gay, Hist. Chile (Zool.)* 4 : 321).

Type = *Homalotrichus striatus* Solier, 1849.

*Hypostenus* Rey, 1884 (*Ann. Soc. Linn. Lyon* 30 : 183, 390).

Type = *Stenus kiesenwetteri* Rosenhauer, 1856.

*Lamprinodes* Luze, 1901 (*Verh. zool.-bot. Ges. Wien* 51 : 180).

Type = *Tachyporus saginatus* Gravenhorst, 1806.

*Leptorus* Casey, 1886 (*Bull. Calif. Acad. Sci.* 2 : 217, 220).

Type = *Leptorus texanus* Casey, 1886.

*Mesostenus* Rey, 1884 (*Ann. Soc. Linn. Lyon* 30 : 183, 326).

Type = *Stenus impressus* Germar, 1824.

*Myrmecodelus* Motschulsky, 1858 (*Bull. Soc. Nat. Moscou* 21 : 239).

Type = *Aleochara angulata* Erichson, 1837.

*Othielus* Casey, 1906 (*Trans. Acad. Sci. St. Louis* 16 : 422, 423).

Type = *Othius laeviusculus* Stephens, 1833.

*Parastenus* Heyden, 1905 (*Wien. ent. Ztg* 24 : 262).

Type = *Stenus impressus* Germar, 1824.

*Pseudidus* Mulsant & Rey, 1875 (*Ann. Soc. Agric. Lyon* (4) 8 : 574).

Type = *Remus sericeus* Holme, 1837.

*Pseudocypus* Mulsant & Rey, 1875 (*Ann. Soc. Agric. Lyon* (4) 8 : 291).

Type = *Staphylinus mus* Brullé, 1832.

*Quedionuchus* Sharp, 1884 (*Biol. Cent. Amer.* 1 (2) : 336).

Type = *Staphylinus laevigatus* Gyllenhal, 1810.

*Rabigus* Mulsant & Rey, 1875 (*Ann. Soc. Agric. Lyon* (4) 8 : 523).

Type = *Staphylinus pullus* Nordmann, 1837.

*Tadunus* Schiødte, 1866 (*Naturh. Tidsskr.* (3) 4 : 147).

Type = *Staphylinus fracticornis* Paykull, 1790. (See p. 229.)

*Thassophila* Bernhauer, 1902, *Verh. zool.-bot. Ges. Wien* 52 (Beiheft) : 116.

Type = *Aleochara angulata* Erichson, 1837.

*Trachyopus* Rey, 1882, *Ann. Soc. Linn. Lyon* 28 : 243.

Type = *Tachyporus tersus* Erichson, 1839.

*Trichopygus* Nordmann, 1837, *Symbolae* : 137.

Type = *Tachyporus dissimilis* Gravenhorst, 1802.

#### IV. Alterations in Specific Names.

*Bledius fracticornis* (Paykull, 1790) (*Mon. Car. App.* : 135).

This species was described as a *Staphylinus*, and Müller having previously described a *Staphylinus fracticornis* in 1776 (*Zool. Dan. Prodr.* : 99), the name must be rejected as a homonym.



Gravenhorst regarded the species as a form of his *Oxytelus pallipes*, calling it *pallipes gallicus*; his varietal name *gallicus*, therefore, becomes the trivial name of the species, and the synonymy is :

*Bledius gallicus* (Gravenhorst, 1806)

= *Bledius fracticornis* (Paykull, 1790, nec Müller, 1776).

*Bledius arenarius* (Paykull, 1800) (*Fn. Suec.* 3 : 382).

This species also was described as a *Staphylinus* and the name is a homonym, since Fourcroy had described a *Staphylinus arenarius* in 1785 (a *Platystethus*). There are no synonyms for this species of *Bledius* so a new name must be given to it; I propose the name *arenoides*, and the synonymy is :

*Bledius arenoides* nom. n.

= *Bledius arenarius* (Paykull, 1800, nec Fourcroy, 1785).

*Stenus bipunctatus* Erichson, 1839 (*Käf. Mark Brandenb.* : 530).

Ljungh in Weber & Mohr, *Arch.* 1804, 1 (1) : 68 described a *Stenus bipunctatus*, a species of *Euaesthetus*; Erichson's name, therefore, is a homonym. The name *biguttatus* Stephens, 1833, is preoccupied by Linnaeus, 1758, and *bipustulatus* Stephens, 1833, is preoccupied by Ljungh, 1804, a synonym of the same species. The only other synonym is *comma* Leconte, 1863 (*New Spec. Col.* 1 : 50).

The synonymy is :

*Stenus comma* Leconte, 1863

= *biguttatus* Stephens, 1833, nec Linnaeus, 1758

= *bipustulatus* Stephens, 1833, nec Ljungh, 1804

= *bipunctatus* Erichson, 1839, nec Ljungh, 1804.

*Xantholinus glaber* Nordmann, 1837 (*Symbolae* : 114).

The reference given for this species in the *Coleopt. Cat.* is Nordmann, 1837 : 114. Nordmann ascribed the species to Gravenhorst, and Erichson (*Gen. Staph.* : 325) quoted *glaber* var. b. Gravenhorst. If it could be established that the Gravenhorst species is different from that described by Nordmann, Nordmann's name would be preoccupied. If, on the other hand, the two species are identical, the name should be ascribed to Gravenhorst, but would still be invalid as a homonym, for Gravenhorst described his species as a *Staphylinus*, and Müller in 1776 (*Zool. Dan. Prodr.* : 98) had previously described a *Staphylinus glaber*, probably *Quedius laevigatus* Gyllenhal.

The *Xantholinus* must be known as *angularis* Ganglbauer, 1895, a name given to a colour form of the species. *X. flavipennis* Redtenbacher, 1849, is preoccupied by Erichson, 1839, and should be quoted as a synonym, together with "*glaber* (Gravenhorst 1806, pars. ? ; Nordmann, 1837)."

*X. rotundicollis* Stephens, 1833 (*Ill. Brit. Ent. (Mand.)* 5 : 259), should be quoted as a synonym of *angustatus* Stephens, 1833.

*Xantholinus punctulatus* (Paykull, 1789) (*Mon. Staph.* : 30).

The name *punctulatus* (Goeze, 1777) has been restored in place of *fulvipennis* (Fabricius, 1792) for a species of *Gyrophypnus* (*Othius*); but the fact has been overlooked that since Goeze described his species as *Staphylinus*, Paykull's *punctulatus*, also described as *Staphylinus*, is a homonym. The name cannot

therefore be used for the *Xantholinus* species. It is difficult also, for another reason, to realise why the authors of the *Coleopt. Cat.* retained this name, they gave as a synonym *fracticornis* (Müller, 1776), which name, having the priority, should have been adopted. The synonymy is :

*Xantholinus fracticornis* (Müller, 1776) (*Zool. Dan. Prodr.* : 99)  
= *punctulatus* (Paykull, 1789, *nec* Goeze, 1777).

*Leptacinus linearis* (Gravenhorst, 1802) (*Staphylinus*) (*Col. Micr. Brunsv.* : 43).

*L. linearis* is a homonym, for Olivier had previously described a *Staphylinus linearis*, namely the *Xantholinus* species of that name (1795, *Entomologie* 3 (42) : 19). The *Leptacinus* species must be known by the name *sulcifrons* Stephens, the synonymy being :

*Leptacinus sulcifrons* (Stephens, 1833)  
= *linearis* (Gravenhorst, 1802, *nec* Olivier, 1795).

*Gabrius velox* Sharp, 1910 (*Ent. mon. Mag.* 46 : 130).

This species was described as a *Gabrius* and as long as that genus is considered to be distinct from *Philonthus*, an opinion with which I agree, the name is valid. If, however, this group of beetles be regarded as belonging to the genus *Philonthus*, in which they are placed in the *Coleopt. Cat.*, the name must be abandoned, since Runde had previously (1835, *Brach. Hal.* : 9) described a *Staphylinus velox*, which, from its five-punctate thorax and similarity of form to *Philonthus fulvipes* Fabricius, was evidently a species of *Philonthus*. In this case the species should be known as :

*Philonthus primigenius* (Joy, 1915) (*Ent. mon. Mag.* 49 : 25)  
= *Philonthus velox* (Sharp, 1910, *nec* Runde, 1835).

*Gabrius vernalis* (Gravenhorst, 1806) (*Staphylinus*) (*Mon. Col. Micr.* : 75).

This name is a homonym, for Müller had previously (1776, *Zool. Dan. Prodr.* : 98) described a *Staphylinus vernalis* (= *Tachyporus obtusus* Linnacus). The correct name for the species is therefore :

*Gabrius osseticus* (Kolenati, 1846) (*Melet. Ent.* 3 : 20)  
= *vernalis* (Gravenhorst, 1806, *nec* Müller, 1776).

It must be noticed that the name *suaveolens* Stephens, 1833, is a synonym of *ventralis* (Gravenhorst, 1802), and is not a synonym of this species. I have examined the single specimen in the Stephens Collection at the British Museum.

*Philonthus carbonarius* (Gyllenhal, 1810) (*Ins. Suec.* 1 (2) : 319).

This name has been retained in the *Coleopt. Cat.* in spite of the fact that the name *carbonarius* (Gravenhorst, 1802) has been placed by the authors of that work as a synonym under the name *varius* (Gyllenhal, 1810) ab. *picimanus* (Ménétriés, 1832). The name is a homonym and cannot be used for this species, which must be called :

*Philonthus tenuicornis* Mulsant & Rey, 1853  
= *carbonarius* (Gyllenhal, 1810, *nec* Gravenhorst, 1802).

For the present it seems wisest to abandon the name *carbonarius* (Gravenhorst, 1802), unless it can be definitely established which was the beetle to which the

author referred. Kirschenblatt (1933, *Rev. Ent. URSS* 25 : 102-103) has shown that the *picimanus* Ménétériés is a distinct species, and to the variety of *varius* Gyllenhal, which Fauvel erroneously thought to be *picimanus* Ménétériés, he has given the new name *menetriesi* Kirschenblatt. He makes no reference to the name *carbonarius* Gravenhorst. There are therefore two species :

- (1) *Philonthus picimanus* (Ménétériés, 1832)
- (2) *Philonthus varius* (Gyllenhal, 1810)
  - ab. *menetriesi* Kirschenblatt, 1933
  - = *picimanus* Fauvel, 1874, *nec* (Ménétériés, 1832)
  - = ? *carbonarius* (Gravenhorst, 1802).

*Philonthus chalceus* Stephens, 1832.

I pointed out in 1937, *Ent. mon. Mag.* 73 : 190, that this name could not be used, since it referred to another species, and said that the name *proximus* Kraatz must be used in its place. Since then I have had reason to believe that Kraatz' species of that name, described from India, is not the same as the European species to which the name has been applied, and which Kraatz himself knew as *carbonarius*. The synonymy of the species therefore is :

*Philonthus succicola* Thomson, 1860

- = *carbonarius* Erichson, 1839; Kraatz, 1857; Mulsant & Rey, 1875
- = *chalceus* Ganglbauer, 1895, *nec* Stephens, 1832
- = *nigritus* (Runde, 1835, *nec* Gravenhorst, 1806)
- = *proximus* Fauvel, 1874; Fowler, 1888; *nec* Kraatz, 1859; *nec* Wollaston, 1857.

Furthermore *proximus* is a preoccupied name, having been used by Wollaston in 1857 for a species of the genus. To the Indian species, the true *proximus* Kraatz, therefore, I have given the name *Philonthus explanipes* (1939, *Ent. mon. Mag.* 75 : 218).

Note on the trivial name "*nigrita*."

I have been able to trace no such word in the Latin language, and from a consideration of its earlier usage there seems no doubt but that it is a coined word and a noun in apposition. Used first by Scopoli (1763) for a species of *Musca*, it is next found used in a masculine genus, *Vespertilio*, by Schreber in 1774. Fabricius used the word for a number of species in genera of masculine and feminine gender, and in his first use of the name (1775) he spelt it with a capital N, as he spelt other proper nouns in the same work. Although it was not long before the word came to be treated as an adjective, appearing with the *-us* termination when given to species in masculine genera, yet the *-a* termination of the original has remained to this day in some masculine genera, as, for example, *Pterostichus nigrita* Fabricius, *Hydroporus nigrita* Fabricius, and *Philonthus nigrita* Gravenhorst. Can a *nigrita* and a *nigritus* exist within the same genus? *nigrita* is retained in a masculine genus both because it is a noun and therefore cannot have its termination changed and also because under Article 18 of the International Code of Zoological Nomenclature the original spelling must be retained. The differences in spelling between *nigritus* and *nigrita* are not amongst those specified under Article 35 as making the two words homonyms. It would appear, therefore, that both may occur within the same genus. But, on the other hand, according to Article 14, adjectives must agree grammatically with the generic name. Thus a valid *nigritus* (adj.) would become invalid in the same genus as a previous *nigrita* (subst.), if for any reason the

generic name had to be changed from a masculine to a feminine name. There is thus an inconsistency if the code is applied literally, and until the matter has received a ruling from the International Commission, whatever line is taken is open to dispute. Interpreting the rules as meaning that an adjectival trivial name is to be rejected as a homonym if previously used in the genus with either of its terminations of gender, I have rejected Runde's *nigritus* as being a homonym of *nigrita* Gravenhorst in the genus *Philonthus*.

*Philonthus viridanus* Horn, 1884 (*Trans. Amer. ent. Soc.* 11 : 22).

This name must be suppressed as a homonym, since Nordmann described another species under that name in 1837 (*Symbolae* : 74). The synonymy of the two species is :

- (1) *Philonthus laminatus* (Creutzer, 1799)  
= *viridanus* (Nordmann, 1837).
- (2) *Philonthus chlorinus* nom. n.  
= *viridanus* Horn, 1884, *nec* (Nordmann, 1837).

*Philonthus apicipennis* Cameron, 1932 (*Fn. Brit. Ind. Coleopt. Staph.* 3 : 117).

This name is preoccupied in use by Lynch-Arribalzaga, 1884 (*Bol. Acad. Cordoba* 7 : 155). The synonymy of the two species is :

- (1) *Philonthus flavolimbatus* Erichson, 1840  
= *apicipennis* Lynch-Arribalzaga, 1884.
- (2) *Philonthus terminipennis* nom. n.  
= *apicipennis* Cameron, 1932, *nec* Lynch-Arribalzaga, 1884.

*Philonthus excelsus* Cameron, 1932 (*Fn. Brit. Ind. Coleopt. Staph.* 3 : 147).

Cameron described a species *Hesperus excelsus* (1931, *Rec. S. Austr. Mus.* 4 : 361), but subsequently pointed out (1937, *Nova Guinea* 1 : 101) that the species was attributed to the genus *Hesperus* owing to a printer's error, and that it is in reality a *Philonthus*. This being so, the name of his Indian species is invalid, and I propose for it the name ***Philonthus perexcelsus*** nom. n.

*Philonthus antennatus* Bernhauer & Schubert, *Coleopt. Cat.* 57 : 328.

This name was given by the authors to *Philonthus serraticornis* Bernhauer 1908 (*nec* Sharp 1876). The name, however, being a homonym, cannot stand. It has been used twice previously, namely by Guérin 1844, who described *Styngetus antennatus* as "*Philonthus antennatus*," and by Motschulsky 1858 for a species of *Philonthus* now known as *distinctus* Gemminger & Harold, 1868. I propose therefore the name ***Philonthus aemulus*** nom. n. for Bernhauer's African species.

*Philonthus dimidiatus* (Sahlberg, 1817) (*Ins. Fenn.* 1 : 326).

Panzer in 1796 (*Fn. Germ.* 27 : 24) described *Paederus dimidiatus*, which species is said to be *Philonthus tenuis* (Fabricius, 1792). Sahlberg's name therefore cannot be used for another species in the same genus. The earliest synonym given in the *Coleopt. Cat.* is *caucasicus* (Nordmann, 1837) (*Symbolae* : 99), which becomes the name of the species.

*Philonthus nitescens* Horn, 1884 (*Trans. Amer. ent. Soc.* 11 : 182).

This name is a homonym, having been used by Stephens, 1832, for another species of the genus. The two species are :

- (1) *Philonthus albipes* (Gravenhorst, 1802)  
= *nitescens* (Stephens, 1832).
- (2) *Philonthus gaudens* nom. n.  
= *nitescens* Horn, 1884 nec Stephens, 1832.

*Philonthus nitidulus* (Gravenhorst, 1802) (*Staphylinus*).

This name is a homonym, since Fabricius, 1781 (*Spec. Ins.* 1 : 337) had already described a *Staphylinus nitidulus*, the *Tachyporus* of that name. The *Philonthus* therefore must be known as *denigrator* (Gravenhorst, 1806) (*Mon. Col. Micr.* : 92).

*Philonthus chilensis* Bernhauer, 1939, *Arb. morph. tax. Ent.* 6 : 13.

This name is a homonym; it was used by Solier in 1849 and by Bernhauer & Schubert in 1914. Although Bernhauer's homonym of 1914 was sunk by Scheerpeltz in 1933, Bernhauer has now made a second homonym of the same name. The three species in question are :

- (1) *Philonthus sordidus* (Gravenhorst, 1802) (*Col. Micr. Brunsv.* : 176)  
= *chilensis* Solier, 1849 (*in Gay, Hist. Chile (Zool.)* 4 : 315).
- (2) *Philonthus germaini* Scheerpeltz, 1933 (*Coleopt. Cat.* 129 : 1344)  
= *chilensis* Bernhauer & Schubert, nom. n. 1914 (*Coleopt. Cat.* 57 : 332,  
nec Solier, 1849)  
= *cribripennis* Germain, 1903 (*An. Univ. Chile* 113 : 24), nec Sharp,  
1885.
- (3) *Philonthus evitendus* nom. n.  
= *chilensis* Bernhauer, 1939, nec Bernhauer & Schubert, 1914, nec  
Solier, 1849.

*Quedius attenuatus* (Gyllenhal, 1810).

This name is retained by Scheerpeltz in the *Coleopt. Cat.* 129, although he recognised that the name *attenuatus* Gravenhorst, 1806, had priority. Erichson regarded Gravenhorst's species as being the same as his *maurorufus* and he regarded it as distinct from the Gyllenhal species : but without paying any attention to the question of priority, he retained Gyllenhal's name and sunk Gravenhorst's as a synonym of his own new species. Erichson's *maurorufus* is a synonym of *limbatus* Heer, and distinct from *maurorufus* (Gravenhorst, 1806); Ganglbauer therefore is in agreement with Erichson when he placed *attenuatus* Gravenhorst as a synonym of *limbatus* Heer. Scheerpeltz (*loc. cit.*) stated in a footnote that he is not using the name *attenuatus* Gravenhorst, owing to doubt as to the identity of the species. Probably Gravenhorst confused several species under the name. Either *attenuatus* Gravenhorst must be rejected altogether because of doubts as to its identity, or one must accept Erichson's opinion as to the identity of the species, in which case the name must be used in preference to *limbatus* Heer, 1834. In neither case can *attenuatus* Gyllenhal be retained as the name for another species, and the name *hyperboreus* Erichson, 1840, must be adopted in its place. It is incorrect to call *rufipennis* Stephens a variety of this species. Of the two specimens in his collection the one bearing the *Manual* number is, I believe, an immature *fulvicollis* Stephens, the other lacks head and thorax but is probably not the present species.

*Bolitochara lunulata* (Paykull, 1789) (*Mon. Staph. Suec.* : 58).

Since Paykull described this species as a *Staphylinus*, the name is a homo-

nym, Linnaeus having described a species of *Lordithon* (*Bolitobius*) as *Staphylinus lunulatus* (1761, *Fn. Suec.* (ed. II) : 231). The *Bolitochara* must be known by the name *pulchra* (Gravenhorst, 1806).

*Aleochara crassicornis* Lacordaire in Boisduval & Lacordaire, 1835 (*Fn. Ent. Paris* 1 : 531).

This name is a homonym, having been used by Gyllenhal in 1827 for a species of *Atheta* which he described as *Aleochara crassicornis*. Gyllenhal's name has rightly been sunk as a synonym of *granigera* Kiesenwetter, 1850, because Fabricius's *Staphylinus crassicornis*, 1792, is also an *Atheta*. The synonymy of the *Aleochara* is :

- Aleochara ripicola* Mulsant & Rey, 1874 (*Ann. Soc. Linn. Lyon* (n.s.) 20 : 312) = *Hist. nat. Coleopt. Fr.* (Brev. Al.) 2 : 28
- = *crassicornis* Lacordaire in Boisduval & Lacordaire, 1835, nec Gyllenhal, 1827
- = *laevigata* Lacordaire in Boisduval & Lacordaire, 1835, nec Gyllenhal, 1810
- = *lateralis* Heer, 1839, nec Erichson, 1839
- = *rufipennis* Erichson, 1839, nec Stephens, 1832.

(Note.—The dates for the name *lateralis* are apparently the same, but to give preference to Heer's name would cause confusion in the name of Erichson's *lateralis*.)

*Aleochara pulchra* Bernhauer, 1901, *Verh. zool.-bot. Ges. Wien* 51 : 479.

This name is preoccupied by *Aleochara pulchra* Gravenhorst, 1806, a species of *Bolitochara*. I propose in its place the name *Aleochara gaudiuscula* nom. n.

#### V. The genus *Gyrohypnus* Samouelle.

The generic name *Gyrohypnus* Samouelle, well known a century ago, has in most recent literature and catalogues appeared only as a synonym. Since it has priority over the names under which it is placed as a synonym, it is necessary to decide whether it should be reinstated or whether its suppression is justifiable, and if it can be reinstated it is still further necessary to ascertain the correct usage of the name.

Samouelle in 1819, *Ent. Useful Compendium* : 172, in an observation on the genus *Staphylinus* Linnaeus, stated "Several new genera have been formed from this genus of which the following species may be considered as the types : <sup>1</sup> . . . Genus *Gyrohypnus* Kirby—*Staphylinus fulgidus*."

The name therefore is valid, provided that one can reasonably be sure of the species to which he referred.

The *Catalogus Coleopterorum* shows with regard to the names *Gyrohypnus* and *fulgidus* :

- (a) (1) "*Gyrohypnus* Mannerheim, 1830," placed as a synonym of *Xantholinus* Serville, 1825.
- (2) "*Gyrohypnus* Thomson, 1860," placed as a synonym of *Baptolinus* Kraatz, 1856-58.

and no other references to this name prior to 1875.

<sup>1</sup> Samouelle used the definite article and did not use the word "type" there as "example."

- (b) (1) *Xantholinus fulgidus* Gravenhorst, 1802—a synonym of *Xantholinus glabratus* Gravenhorst, 1802.
- (2) *Othius fulgidus* Paykull, 1789—a synonym of *Othius punctulatus* Goeze, 1777.
- (3) *Quedius fulgidus* Fabricius *Mant. Ins.* I, 1787, p. 220.
- (4) *Gauropterus fulgidus* Fabricius *Mant. Ins.* I, 1787, p. 220.

From these it would appear that :

(a) The name *Gyrophypnus* Samouelle (1819) has priority over all the names to which it has been applied as a synonym or which have been used for a species *fulgidus*, namely *Xantholinus* 1825, *Othius* 1833, *Quedius* 1832, *Baptolinus* 1856–58, *Gauropterus* 1860.

(b) There is a great error in specific diagnosis, for Fabricius's *Staphylinus fulgidus* cannot be both a *Quedius* and a *Gauropterus*, with the same reference, as given in the Catalogue !

The task then is to decide, if possible, which of the four species mentioned above Samouelle regarded as *Staphylinus fulgidus*, since all four were described under this title. From the position of the genus relative to other genera in Samouelle's work, no help can be obtained, the order being *Creophilus*, *Velleius*, *Emus*, *Staphylinus*, *Ocyppus*, *Gyrophypnus*, *Lathrobium* etc., but it would appear definitely to rule out the *Quedius* species. This is confirmed by the fact that Samouelle attributed the genus to Kirby ; and Stephens, both in his *Ill. Brit. Ent. (Mand.)* 5 and in his *Manual* gave Kirby's genus as a *Xantholinid* genus, and furthermore no *fulgidus* appeared there under *Quedius*, but (p. 258) *fulgidus* is mentioned as the type of *Othius*.

It is quite clear that *Xantholinus glabratus* Gravenhorst was not the species known in this country as *fulgidus*, for both Marsham and Stephens knew it under the name *cruentatus* Marsham, and Stephens himself in his *Manual* stated that the Marsham and Gravenhorst species were identical.

This narrows the choice down to the species of *Othius* or of *Gauropterus*. Here again Stephens is explicit ; for firstly he says in the *Manual* "*Xantholinus fulgidus* Fab. *Ent.* II : 609? = *Staphylinus pyropterus* Gravenhorst" (which according to Erichson is the *Gauropterus* species), and he had used the latter name in the *Ill. Brit. Ent.* for a species with undilated anterior tarsi ; and secondly he says *Othius fulvipennis* F. = *O. fulgidus* Steph., a species described in the *Ill. Brit. Ent.* as having anterior tarsi dilated, and he placed this species under *Othius*. It is beyond question that the *fulgidus* of the British authors was the *Othius* species, and therefore the name *Gyrophypnus* Samouelle 1819 must be used instead of *Othius* Stephens, 1833.

Stephens' remarks on this species are confusing, and show how authors would transfer a species from one genus to another without considering type-fixation. Under *Gyrophypnus* Kirby (*Ill. Brit. Ent. (Mand.)* 5 : 258) he wrote "*Staphylinus fulgidus* of Gravenhorst being given as the type of the genus *Xantholinus* of Dahl, and that being merely a catalogue one—but subsequently characterised by the lamented Latreille as having the anterior tarsi not dilated in either sex, a character at variance with the insect above mentioned, which is the type of the genus *Othius*—induced me to adopt the old manuscript name of Kirby for this genus, in preference to that of Dahl, under which a host of dissimilar species have been comprehended ; in which particular I find Mannerheim agrees." On the assumption, therefore (for which there appears to be no evidence), that *fulgidus* is the type of *Xantholinus* Dahl, and because *fulgidus* will not agree with the characters which define *Xantholinus*, Stephens resurrects for *Xantho-*

*linus* the name *Gyrophypnus* Kirby of which *fulgidus* was designated type by Samouelle (1819), at the same time making *fulgidus* the type of his new genus *Othius*.

The error of giving the same Fabrician reference for two species of distinct genera can be traced back to Erichson, which shows the extent to which the work of previous authors is copied in literature. Fabricius himself is originally to blame for the confusion, although it is his references that make it possible to elucidate the difficulty caused by his inadequate descriptions.

In 1787, *Mant. Ins.* 1 : 220, he described a *Staphylinus fulgidus*. Later, 1792, *Ent. Syst.* 1 (2) : 537, he transferred this species to his new genus *Paederus*, but at the same time described another *Staphylinus fulgidus* (p. 525)! His own reference (*Ent. Syst.* 1 (2) : 537, No. 6) shows that the species of the *Mantissa* is his *Paederus* species which is apparently that now known as *Gaurop-terus fulgidus* Fabricius, which name may stand. The second species he described is the *Quedius* species, but the reference should be "*Ent. Syst.* 1 (2) : 525, No. 25" : also the name he used, being a homonym, cannot stand. According to the *Coleopt. Cat.* the next available synonyms are *rufitarsis* Marsham (1802) and *haemopterus* Stephens (1832), *iracundus* Say (1834), *assimilis* Nordmann (1837). With reference to these, Dr. Blair has kindly examined the Stephens Collection and informed me (1) that there is no reference to the Marsham species in the collection, and (2) that the specimens of *haemopterus* are not *fulgidus* but *picipes* Mannerheim.

In the absence of specimens, and in view of the inadequacy of the description to determine the species ("antennae nigrae" seems *not* to refer to the species), the Marsham name cannot be accepted! Neither can the Stephens name hold good in face of the four specimens in the collection (although this alone would not warrant its rejection were there other definite evidence to establish its validity).

The name *iracundus* Say cannot be used, for Casey states that the American species is different from European examples of *fulgidus* with which he has compared it.

Assuming, therefore, the accuracy of the determination of *assimilis* (Nordmann, 1837) as identical with the *Quedius fulgidus* (Fabricius), this name must be used for the species. Since Nordmann gave this name to a variety of Gyllenhal's *variabilis* as a *Philonthus*, it is not preoccupied by Paykull's *Staphylinus assimilis*, 1800—a species of *Olophrum*.

The genus, therefore, with its type is :

*Gyrophypnus* Samouelle, 1819

= *Othius* Stephens, 1833.

*punctulatus* (Goeze, 1777)

= *fulgidus* (Paykull, 1789 *nec* Fabricius 1787).



## ON TWO COCCIDS RECENTLY DESCRIBED FROM MAURITIUS (HEM.)

By Raymond MAMET, F.R.E.S.

(Rose Hill, Mauritius.)

*Lecanium dorsociliatum* Green and Mamet.

1938, *Proc. R. ent. Soc. Lond.* (B) 7 : 126, fig. 1.

THIS species, which was described from a single adult female, has recently been collected and the following particulars are added to its diagnosis :—

*Living adult female* flattish to moderately convex; concave below, particularly in the abdominal region which is obscured by a layer of white, powdery, waxy secretion; somewhat shiny; faint yellowish-brown speckled with a few black spots. In old adult females darker bands radiate from the submarginal region to the margin. Submarginal area more or less flattened. Margin pale wine-red in colour. Anterior and posterior extremities broadly rounded. Lateral margins more or less parallel. Eyes black, submarginal. Anal region very dark wine-red to black.

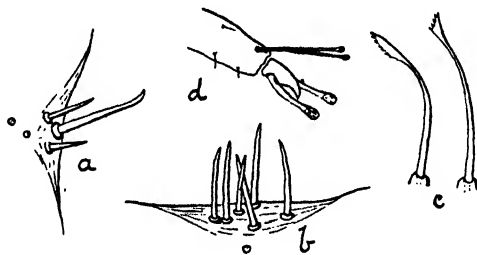


FIG. 1.—*Lecanium dorsociliatum* Green and Mamet—*a*, normal stigmatic spines  $\times 140$ ; *b*, abnormal stigmatic spines  $\times 140$ ; *c*, apically fimbriate marginal cilia  $\times 140$ ; *d*, claw and digitules  $\times 200$ .

*Mounted adult female* normally with 3 stigmatic spines (fig. 1, *a*), of which the median is longer and stouter, with its extremity somewhat curved. The two lateral stigmatic spines are, however, unequal in length. Relative lengths of median, postero-lateral and antero-lateral stigmatic spines = 17, 9, and 7 respectively. One individual exhibited an abnormal stigmatic cleft bearing 6 spines (fig. 1, *b*) of about the same length. *Marginal cilia* of two types: pointed and fimbriate apically (fig. 1, *c*). *Dorsal cilia* pointed. *Claw* as shown in figure 1, *d*. *Anal ring* with 10 long and stout hairs.

Length: 3.3–8.0 mm.; breadth: 1.9–4.2 mm.

*Young larva* pale yellowish-pink.

The *type* (in coll. E. E. Green) was collected on a fern: *Nephrolepis cordifolia*.

PROC. R. ENT. SOC. LOND. (B) 8. PT. 12. (DECEMBER 1939.)

The above description is based on individuals (*metatypes* : in my collection) collected by me on 1.1.1939 at Rose Hill. They were feeding on *Poinciana pulcherrima*.

*Asterolecanium morini* Mamet.

1937, *Proc. R. ent. Soc. Lond.* (B) 6 : 176, fig. 3.

I have recently received from Mr. E. E. Green individuals of his *Asterolecanium pustulans seychellarum* (1910, *J. econ. Biol.* 5 : 3, figs. 10-14<sup>1</sup>) which I compared with my *A. morini*. In the light of this examination, I am convinced that both insects are conspecific and therefore *morini* must be sunk as a synonym of *pustulans seychellarum*.

The differences between *A. pustulans* Ckll. and *A. pustulans seychellarum* Green are so well marked that I do not hesitate to give Green's insect specific rank. The following table will help in separating these two closely related species :

<i>A. pustulans</i> Ckll.	<i>A. seychellarum</i> (Green).
1. Test opaque, granular, not rugose.	1. Test transparent, not granular, rugose.
2. Discal filaments curling, glassy.	2. Discal filaments obsolete.
3. Paired pores scattered throughout the whole body.	3. Paired pores more or less separated into groups on each segment of the body (particularly in the abdominal region), leaving a clear space between each group.

Thanks are due to Mr. E. E. Green, who pointed out to me that my *A. morini* might be equivalent to his *A. seychellarum* and who lent me material.

<sup>1</sup> Described from Seychelles Is. on *Hevea brasiliensis*.

## A NEW GENUS AND TWO NEW SPECIES OF TRYPETIDAE (DIPT.) FROM THE FIJI ISLANDS

By John R. MALLOCH.

(Arlington, Va.)

Communicated by Dr. O. W. RICHARDS, F.R.E.S.

IN 1928 Bezzi recorded 12 species belonging to 9 genera of this family from the Fiji Islands.<sup>1</sup>

The new genus described below is radically different from any so far described or recorded from Fiji, and has many features that set it apart from any described genus of the family. It has a superficial resemblance to the genus *Enicoptera* Macquart, but in the latter the setulae on the upperside of the first wing vein extend almost to the base, the first posterior cell of the wing is very much narrowed at apex, the scutellum has only 4 marginal bristles, and the presutural thoracic bristle is present.

<sup>1</sup> *Dipt. Brachycera and Athericera of the Fiji Islands.*

**Enicopterina** gen. n.

Generic characters: Arista plumose above, shorter haired below and on inner side; third antennal segment not twice as long as wide, rounded at apex; frons a little over one-third of the head width and a little longer than wide, with one pair of incurved infraorbitals close to anterior margin and a pair of reclinate supraorbitals above the middle of orbits, the inner vertical pair longer and stronger than the outer pair, the latter a little longer than the



FIGS. 1-2.—*Enicopterina bivittata*. 1, Head in profile; 2, wing.

supraorbitals and subequal to the parallel pair of post-verticals; postocular cilia dark, short, and setulose; face convex, with deep lateral foveae on upper half, receding a little below; eye almost round, a little higher than long; gena about three-fourths as high as eye, the genal bristle moderately strong; proboscis short and stout; palpi spatulate. Thorax at middle wider than the head, with the following bristles: 1 humeral, 2 notopleurals, 1 supra-alar, 2 postalar, 1 pair of dorsocentrals in line with anterior postalar, 1 pair of prescutellar acrostichals, 1 mesopleural, and 6 subequal scutellars; pteropleura with a setula; propleura soft-haired; disc of scutellum bare. Legs rather long, femora not

strongly bristled, mid tibia with 1 apical ventral spur; no tibial bristles. Second wing vein with a rather deep loop below apex of the first vein and just beyond inner cross vein, the latter about half its own length from outer cross vein; fourth vein broadly depressed into the discal cell, apex of fourth very slightly inclined upward; anal cell with a well-developed apical lower lobe. First vein setulose from near base of node to tip above, third vein setulose from base to near apex above.

Genotype, *E. bivittata* sp. n.

***Enicopterina bivittata* sp. n.**

Female: A glossy fulvous yellow species, the frons browned in front, at ocelli, and on vertex; thorax with two black vittae on the entire extent of the mesonotum that are continued to apex of the scutellum on its sides, and a deep black spot on anterior extremity of the postalar declivity; abdomen with a broad black vitta on each side, the ovipositor black except its tip and extreme base. Head in profile as fig. 1. Eyes bare, with facets in front slightly enlarged. Mesonotum with short depressed coarse dark hairs, all the bristles black; propleural hairs yellow; prosternum with a few black setulose hairs. Postnotum with two faint dark vittae in continuation of the mesonotal vittae. Metasternum haired. Legs yellow, apices of tarsi slightly darkened, apices of tarsal claws black. Wings yellowish hyaline, quite markedly yellow at bases, with blackish-brown markings as fig. 2. Abdomen as long as head and thorax combined, tapered to apex, with many depressed stiff black hairs, longer on sides; sixth tergite with a few black lateral bristles. Length, including genital cone, 12.0 mm.

Fiji: Vunidawa, 29.xi.1932 (*H. Philips*). Type in British Museum.

***Phagocarpus* Rondani.**

1871, Bull. Soc. ent. ital., 3: 171.

I am convinced from a careful comparison of Bezzi's description and figure of *Pseudospheniscus curvinervis* with the genotype and two other species of *Phagocarpus* that Bezzi erred in the generic assignment of his species. It undoubtedly belongs to *Phagocarpus* and I transfer it thereto.

***Phagocarpus curvinervis* (Bezzi).**

1928, *op. cit.*: 114.

***Pseudospheniscus* Hendel.**

1913, Suppl. Ent., 1: 82.

This genus was recorded from Fiji by Bezzi and two species placed in it. One of these has been removed to *Phagocarpus* in this paper. Below I deal with a new species that appears to belong to the genus though in some respects it does not agree with the genotype. It may be distinguished from the other Fijian species as below.

- A. Mesopleura and scutellum entirely black; wing hyaline, with a broad black costal stripe from base to apex ending in middle of apex of first posterior cell, from which emanate three backwardly directed branches, the basal narrow one extending from basal half of the costal cell obliquely across the wing and ending about one-third from apex of anal vein, the central one very broad in front, tapered to hind margin and narrowly separated from the basal one and from the preapical one, the latter in the form of an inverted V, with its inner branch enclosing the outer cross vein, and its outer branch ending in the upper outer angle of the second posterior cell; a subhyaline mark just beyond apex of first vein . . . *bifidus* Bezzi.

- AA. Posterior half or more of the mesopleura and all but the extreme base of the scutellum lemon-yellow, remainder of thorax black; wings whitish hyaline, with black markings as fig. 3 . . . . . *mesopleuralis* sp. n.

***Pseudospheniscus mesopleuralis* sp. n.**

Female: Head in type-specimen greasy, but apparently brownish-yellow, with the face paler and the occiput glossy black, antennae and palpi orange-yellow. Frons at vertex less than one-third of the head width, slightly narrowed to anterior margin, and twice as long as wide, with the usual three pairs of rather weak incurved and slightly forwardly directed infraorbital and two pairs of reclinate supraorbital bristles; ocellars short and hair-like, weaker than the postverticals, the inner verticals rubbed off but the scars show that they were probably quite strong, outer pair short. Third antennal segment fully twice as long as wide, rounded at apex, extending almost to the slightly projecting epistome; eye distinctly higher than long; gena not as high as width of third antennal segment;



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FIG. 3.—*Pseudospheniscus mesopleuralis*, wing.

arista microscopically pubescent. Thorax glossy black, mesopleura lemon-yellow except its anterior lower angle and lower edge; scutellum lemon-yellow except narrowly across base; hairs and bristles black, the hairs on pale part of the mesopleura yellow. Bristling complete, the dorso-central pair very slightly behind level of the supra-alars, only one mesopleural; scutellum flattened, the apical pair of marginal bristles a little shorter than the basal pair, the disc without hairs. Propleura with some fine erect dark hairs, one longer than the others; scapular bristles fine and short. Legs including the fore coxae orange-yellow, mid and hind coxae, femora, and basal half of hind tibiae blackened. Fore femur with a series of rather short postero-ventral bristles; mid tibia with a black apical ventral spur; hind tibia without anterodorsal setulae. Wing whitish hyaline, with black markings (fig. 3). First vein setulose from before apex of node to tip above, bare below; third vein setulose from base to near level of outer cross vein above and at extreme base below; other wing veins bare. Apex of first vein gradually sloping forward to connect with costal vein, not almost rectangularly bent forward as in *Phagocarpus*, the stigma well over half as long as the costal cell; second vein with slight undulation at apex in the black mark; inner cross vein at not more than its own length from outer; antepenultimate section of fourth vein straight. Two hyaline marks in the costal cell, and a small subquadrate hyaline mark in anterior basal cell below the stigma. Halteres yellow. Abdomen broadly ovate, glossy black, undusted, with black hairs and bristles. Sixth tergite very slightly shorter than fifth. Length 4.0 mm.

Fiji: Suva, 7.xii.1937, No. D 266. Type in British Museum.

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